BLM

U.S. Department of the Interior Bureau of Land Management

Final Environmental Assessment

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December 2017 Competitive Oil and Gas Lease Sale

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Chapter 1 Introduction

1.1. Ely District Oil and Gas Leasing

The Ely Resource Management Plan (RMP), signed in 2008 identified areas closed and open to fluid mineral leasing as well as appropriate stipulations to protect resources of concern, and comply with federal law. All leases are subject to the terms and conditions of the standard lease form and additional stipulations and lease notices as identified in the Ely RMP and applied in this site-specific environmental analysis. Table 1.1 is from the Ely RMP and has been updated for lands closed to leasing by the Basin & Range National Monument proclamation and lands identified for Major Restrictions (No Surface Occupancy) in the Sage Grouse RMP Amendment (2015).

Table 1.1 Summary of Fluid Mineral Leasing Designations in Ely District

Ely District Office Area	Acres (approx.)
Open to Fluid Mineral Leasing	
Standard lease Terms and Conditions/ Moderate Restrictions (Timing/Surface Use Limitations)	7,999,400
Major Restrictions (No Surface Occupancy)	1,393,600
Open-Total	9,393,000
Closed to Fluid Mineral Leasing	
Designated Wilderness/Wilderness Study Areas	1,815,400
Discretionary Closures	291,600
Closed-Total	2,107,000
Grand Total	11,500,000

The first oil discovery in Nevada occurred in 1954 in Railroad Valley. Railroad Valley is the predominant area of oil and gas production in Nevada. Nevada's only oil refinery is located here. Most of the valley lies in Nye County, but it crosses into White Pine County at its northern end. Since 1907, over 970 wells have been drilled in Nevada. This includes about 270 wells drilled since 1986 of which about 50 were producers. The late Tertiary volcanic rocks constitute the main reservoir of the oil fields in the Railroad Valley petroleum province. However, the Chainman Shale and the Pilot Shale of the Mississippian ages are the potentially oil-bearing formations most often targeted in the majority of the analysis area.

1.2. Purpose and Need for the Proposed Action

The purpose of the Federal Action is to provide opportunities for private individuals or companies to explore and develop oil and gas resources on specific public lands through a competitive leasing process.

The need for the proposed action is to respond to the nomination or Expressions of Interests (EOIs) for leasing, consistent with the BLM's responsibility under the Mineral Leasing Act (MLA), as amended, to promote the development of oil and gas on the public domain. The public, BLM, or other agencies may nominate parcels for leasing.

The MLA established that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under rules and regulations prescribed

by the Secretary of the Interior, where consistent with land use planning, FLPMA and other applicable laws, regulations, and policies.

1.3. Decision to be Made

The Ely District Office will determine whether or not to recommend leasing all or part of the nominated parcels in the upcoming December 2017 Competitive Oil and Gas Lease Sale to the Nevada BLM Deputy State Director for Minerals Management by September 8, 2017. The Ely District must also determine which notices and stipulations must be attached to the parcels at the leasing stage in order to help protect resources while allowing for exploration and development of mineral resources. The BLM Deputy State Director of Minerals will make the final decision and sign the Decision Record (DR).

The decision to be made is only to identify which parcels are to be leased and which notices and stipulations must be attached to those parcels. The lease does grant certain rights but it does not authorize any ground disturbance or development of the leased parcels. Any development of the leased parcels will be subject to additional NEPA analysis.

1.4. Conformance with BLM Land Use Plan(s)

The proposed actions are in conformance with the Goals and Objectives of the Ely District Record of Decision and Approved Resource Management Plan (BLM 2008b, the Ely RMP), which are to: "*provide for the responsible development of mineral resources to meet local, regional, and national needs, while providing for the protection of other resources and uses* (page 92)." The RMP also states in part, "*It is BLM policy to apply the least restrictive constraint to meet the resource protection objective* (page 97)." In addition, "*Timing limitations indicate that a leased area generally is open to development activities except during a specified period of time to protect identified resource values such as wildlife* (page 92)."

This document is tiered to, and incorporates by reference, the Ely Proposed Resource Management Plan/Final Environmental Impact Statement (BLM 2007, the RMP/FEIS) and the Ely District Record of Decision and Approved Resource Management Plan (BLM 2008b, the Ely RMP).

1.5. Relationship to Statutes, Regulations, or other Plans

The proposed action is in compliance with federal laws and regulations, Executive Orders, and Department of Interior and BLM policies and is consistent, to the maximum extent possible, with state laws and local and county ordinances and plans, including the following:

- Federal Land Policy and Management Act (1976) as amended and the associated regulations at 43 CFR Part 1600
- Mineral Leasing Act (1920) as amended and the associated regulations at 43 CFR Part 3100
- Federal Oil and Gas Leasing Reform Act of 1987 (Reform Act)
- Energy Policy Act (2005)
- National Environmental Policy Act (1969) and the associated CEQ regulations at 40 CFR Parts 1500 through 1508
- Clean Water Act (1972)

- National Historic Preservation Act (1966) as amended and the associated regulations at 36 CFR Part 800
- Endangered Species Act (1973) as amended
- Bald and Golden Eagle Protection Act (1962)
- Migratory Bird Treaty Act (1918)
- BLM Manual 6840- Special Status Species Management

1.6. Scoping

Internal scoping was conducted on June 27, 2017 and July 11, 2017 by an interdisciplinary team composed of Ely District and Nevada State Office staff that analyzed the potential consequences of the proposed action. During the scoping meetings, specific parcels were recommended for delay based on resource concerns.

The Ely District initiated Native American consultation for the December 2017 Oil and Gas Lease Sale on July 17, 2017. A list of tribes that were sent this consultation request can be found in Table 5.1.

Preliminary Issues identified during internal scoping are listed below.

- Desert Tortoise Critical Habitat
- T&E Species of Fishes in White River and Railroad Valleys
- Greater Sage-Grouse and its habitat
- Impacts to Kirch Wildlife Management Area
- Impacts to Cultural Districts and Sites
- Native American Concerns
- Impacts from hydraulic fracturing
- Potential overlap of parcels with utility corridors
- Occupied Desert Bighorn Sheep Habitat — timing stipulations to be applied
- Gila Monster Habitat — stipulations to be applied
- Areas of Critical Environmental Concern (tortoise and cultural)
- Wild Horses

Chapter 2 Description of Alternatives, Including Proposed Action

2.1. Proposed Action – Offer Available Nominated Parcels for Lease

A list of 208 nominated parcels totaling approximately 388,960 acres was submitted to the Ely District on July 14, 2017 (see Map 2.1 and Table 2.1). This total acreage represents approximately 4.1 percent of the acres open to leasing in the Ely District. The parcels are located in White Pine, Nye County, and Lincoln County. Appendix B lists all 208 parcels, the parcel number, acreage, legal description, and Appendix C lists stipulations and notices to be applied to each parcel.

This No Action Alternative considers leasing those portions of the 208 nominated parcels for the December 2017 lease sale that are open for leasing as identified in the Ely District Resource Management Plan. The acreage to be offered for lease under Proposed Action is 388,960 acres.

Once sold, the lessee has the ability to develop the lease by exploring, drilling, and producing all of the oil and gas within the lease boundaries, subject to the stipulations and notices attached to the lease (Title 43 CFR 3101.1–2). Leases are issued for a 10 year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; ownership of the lease reverts back to the federal government and the lease can be resold.

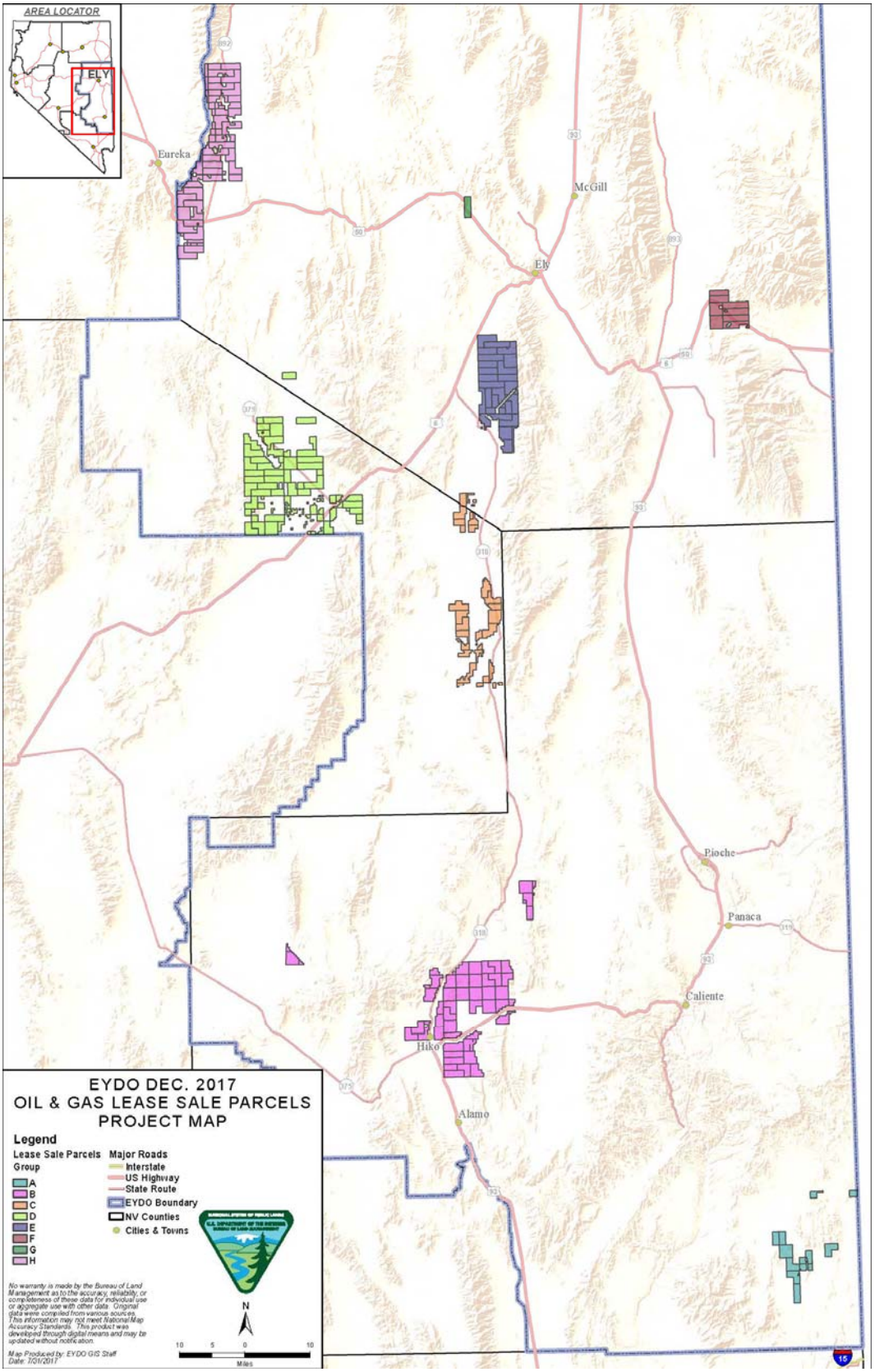
All parcels contain a Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) and Executive Order 13007. All parcels also contain an Endangered Species Act (ESA) Notice, which requires compliance with Section 7 of the ESA. Standard terms and conditions as well as special stipulations listed in the RMP would also apply.

In order for a lessee to exercise their rights to explore or develop a lease, an Application for Permit to Drill (APD) must be submitted and approved. Additional NEPA analysis is prepared for these site specific plans. Site-specific mitigation measures and BMPs (Appendix A and the Gold Book) would be attached as Conditions of Approval (COAs) for each proposed activity. Any proposed APD would be analyzed under additional project and site-specific analysis per the National Environmental Policy Act (NEPA). The level of further NEPA analysis would depend upon the results of scoping and the particulars of the proposed action.

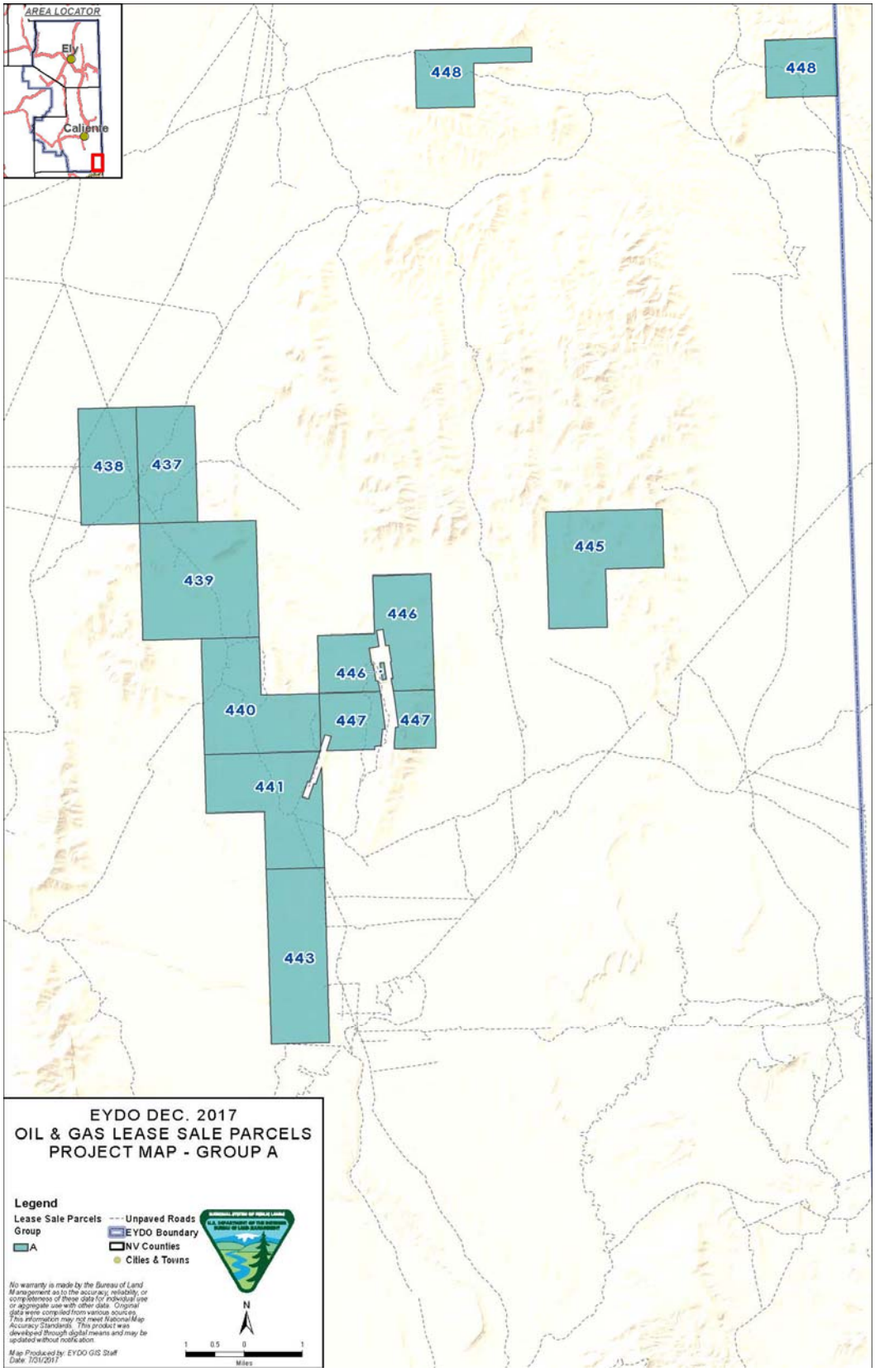
Table 2.1 Parcel Groups for December 2017 Ely District Competitive Lease Sale

Group	Number of Parcels	Field Office	County	Acres*
A	10	Caliente	Lincoln	16,453
B	53	Caliente	Lincoln	94,946
C	21	Bristlecone	Nye & White Pine	33,755
D	49	Bristlecone	Nye & White Pine	90,086
E	26	Bristlecone	White Pine	53,544
F	8	Bristlecone	White Pine	18,061
G	1	Bristlecone	White Pine	2,023
H	40	Bristlecone	White Pine	80,092
Totals	208	Ely District	Lincoln, Nye, & White Pine	388,960

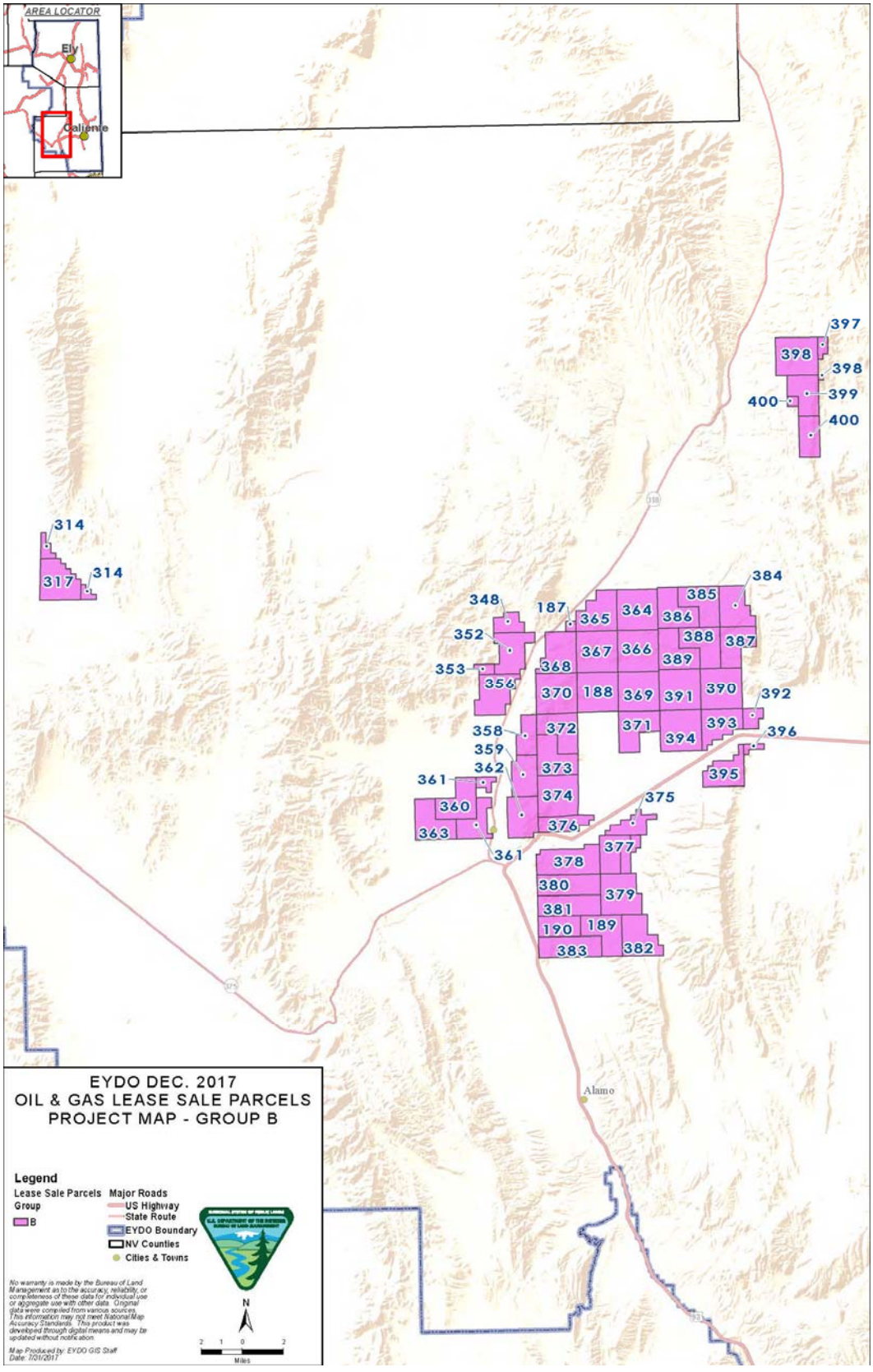
Map 2.1 Ely District Oil & Gas Lease Sale - Project Map



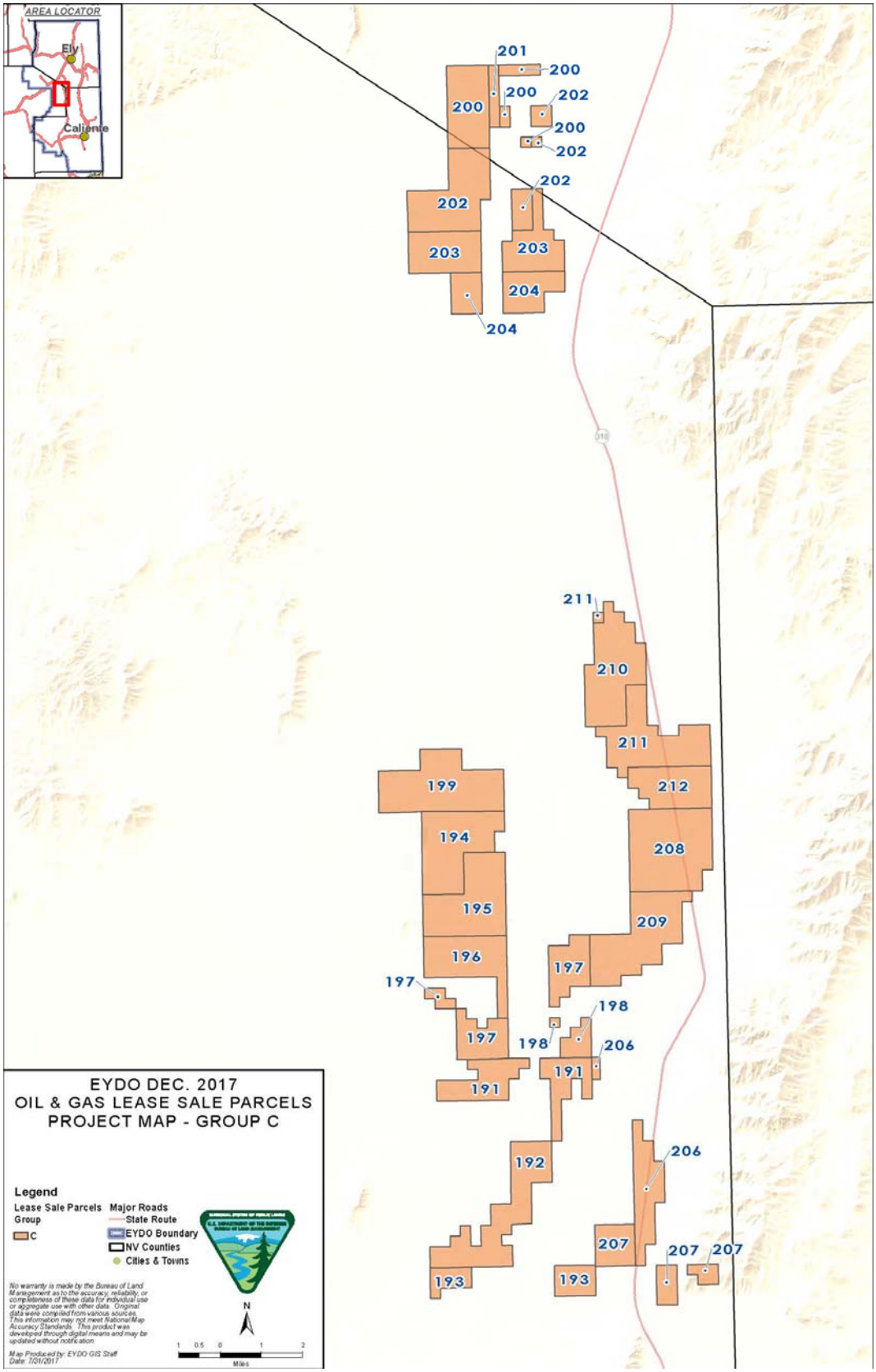
Map 2.2 Ely District Oil & Gas Lease Sale - Parcel Group A



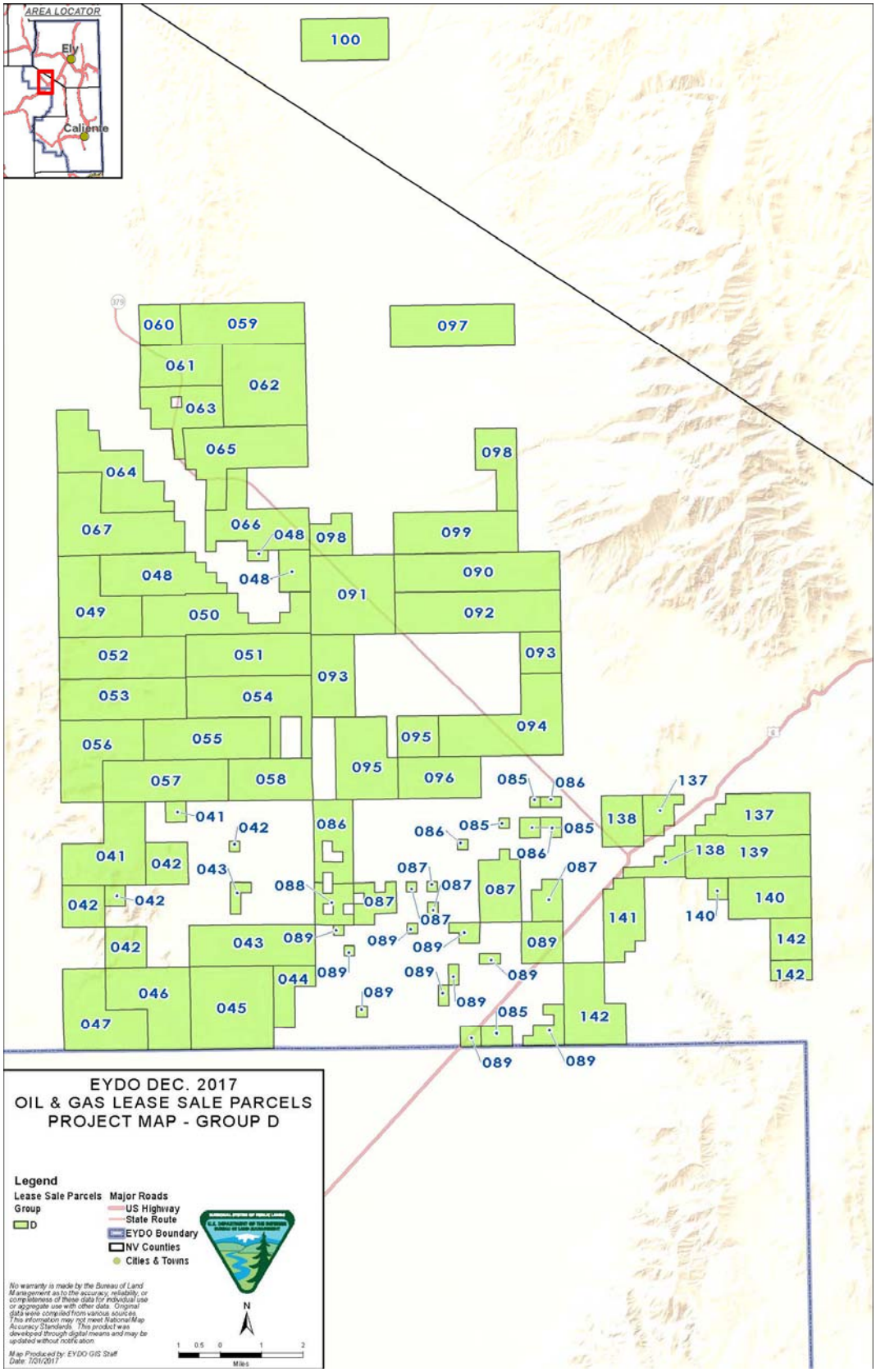
Map 2.3 Ely District Oil & Gas Lease Sale - Parcel Group B



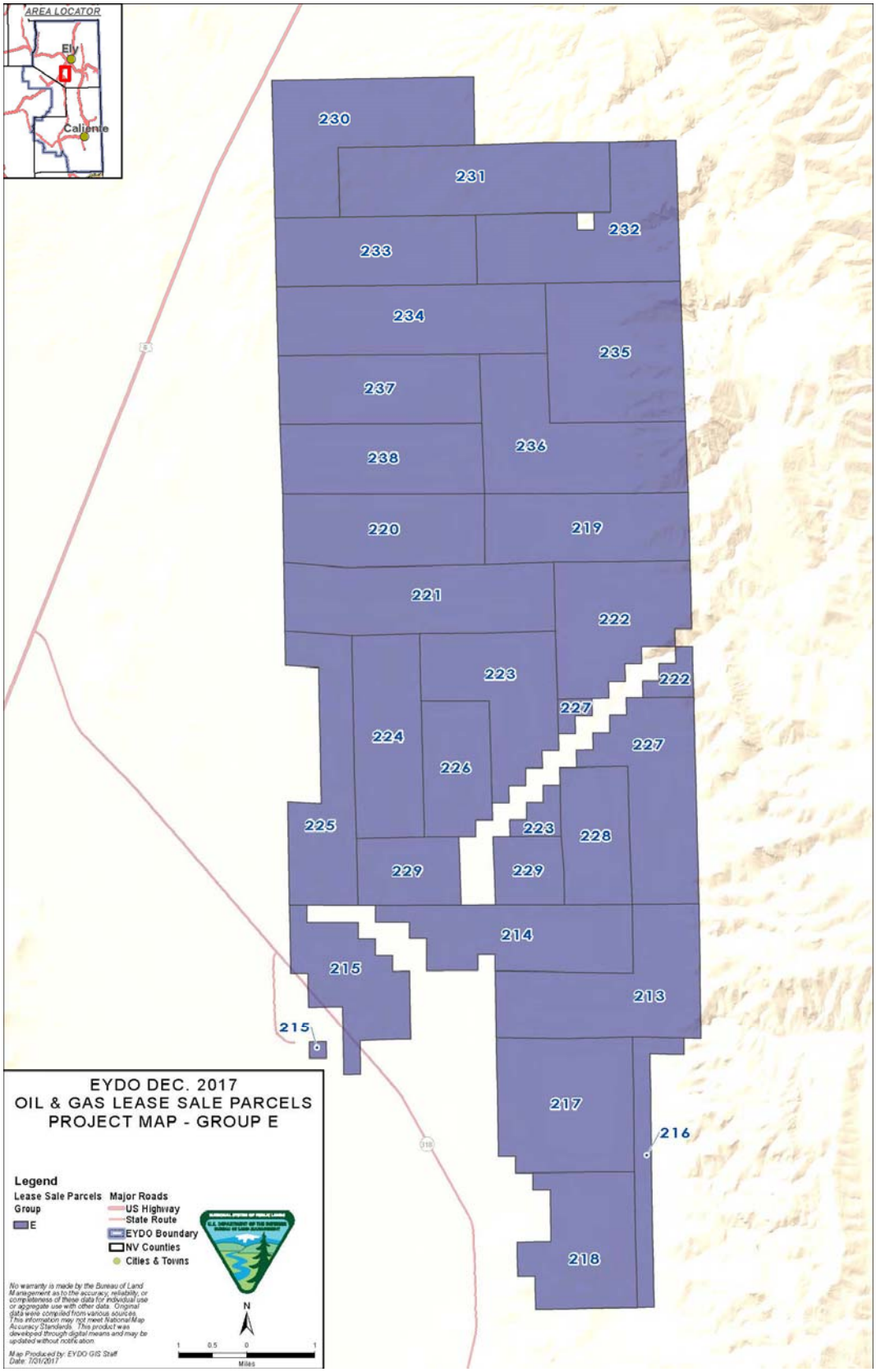
Map 2.4 Ely District Oil & Gas Lease Sale - Parcel Group C



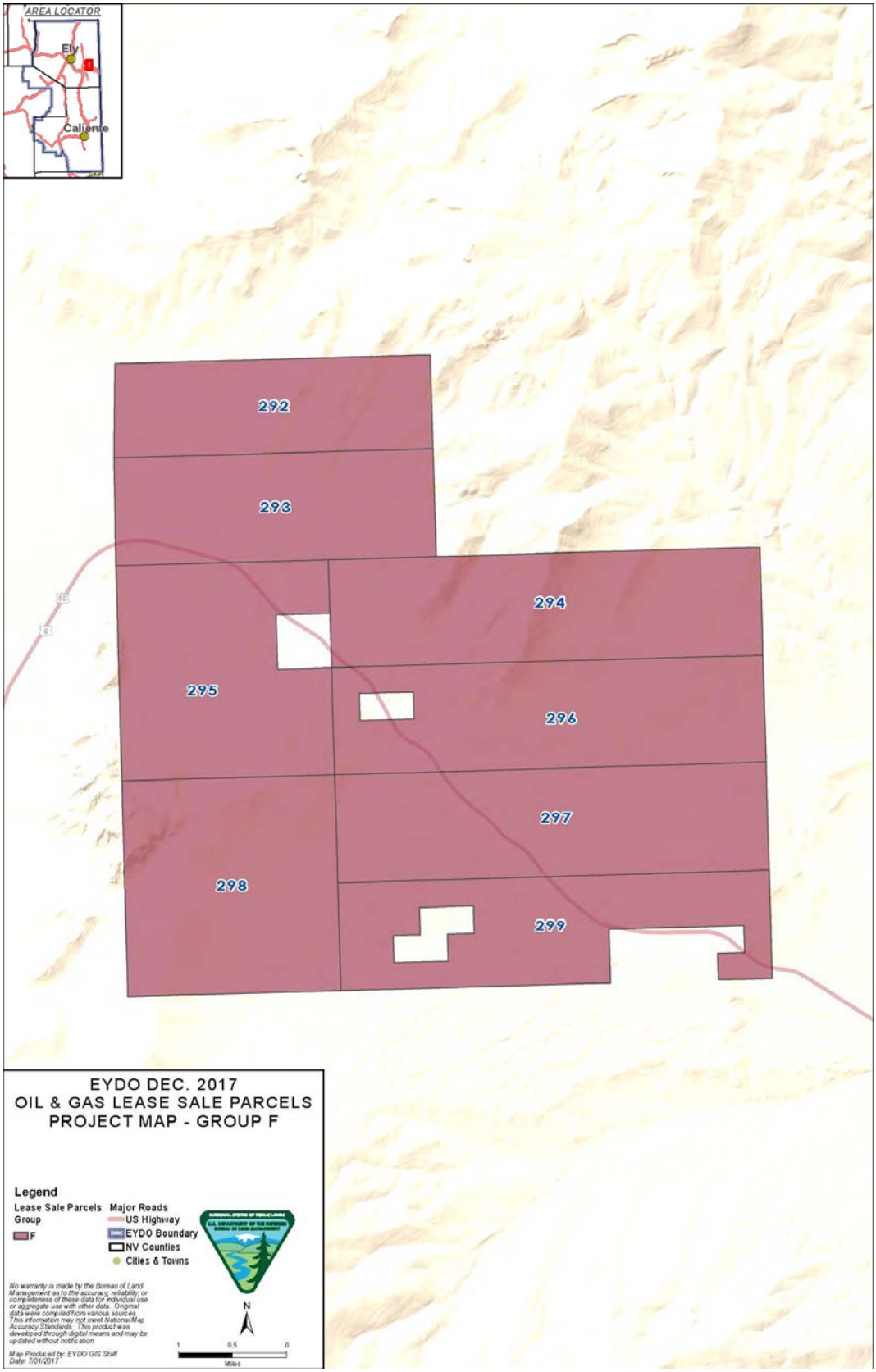
Map 2.5 Ely District Oil & Gas Lease Sale - Parcel Group D



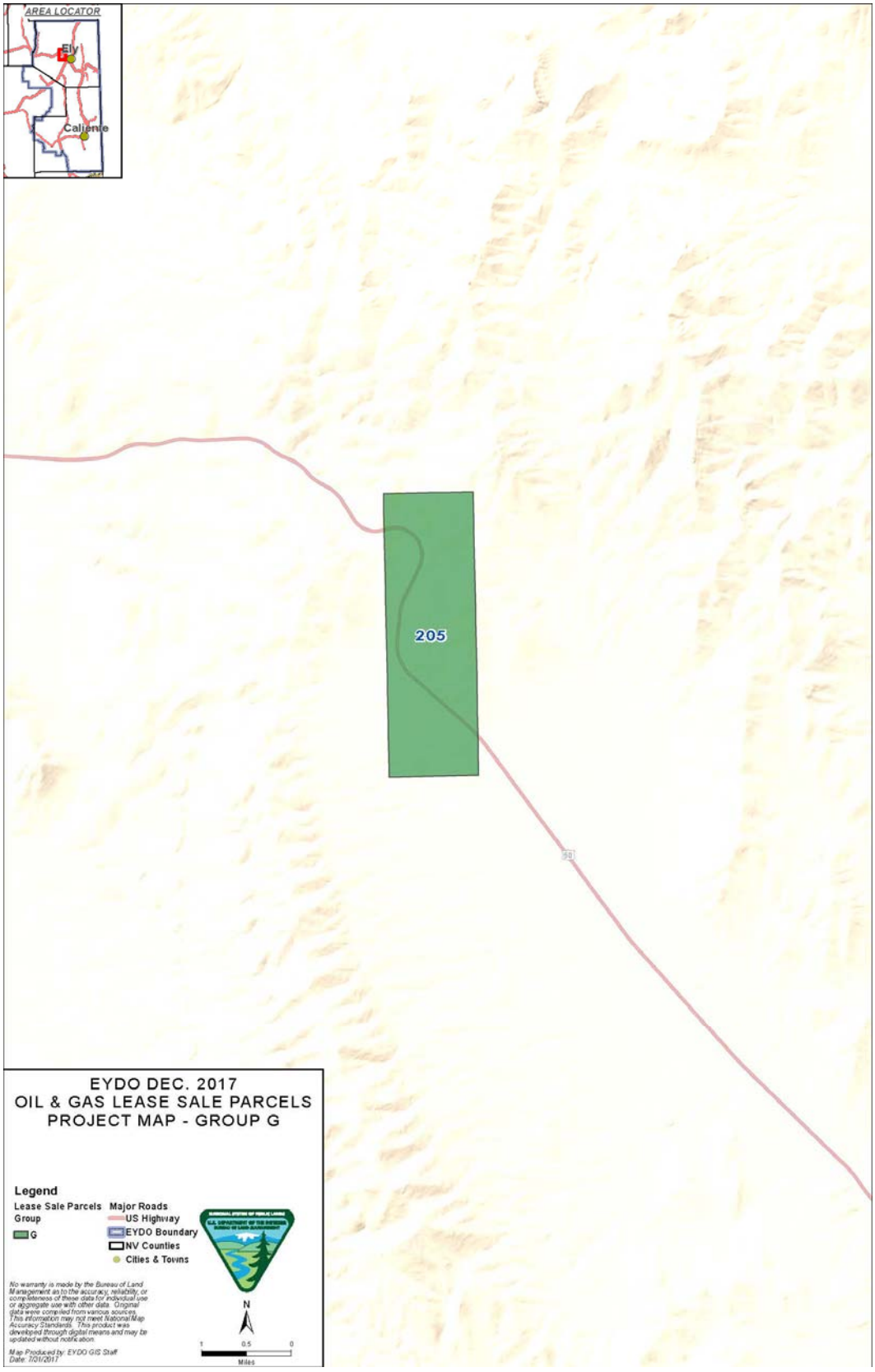
Map 2.6 Ely District Oil & Gas Lease Sale - Parcel Group E



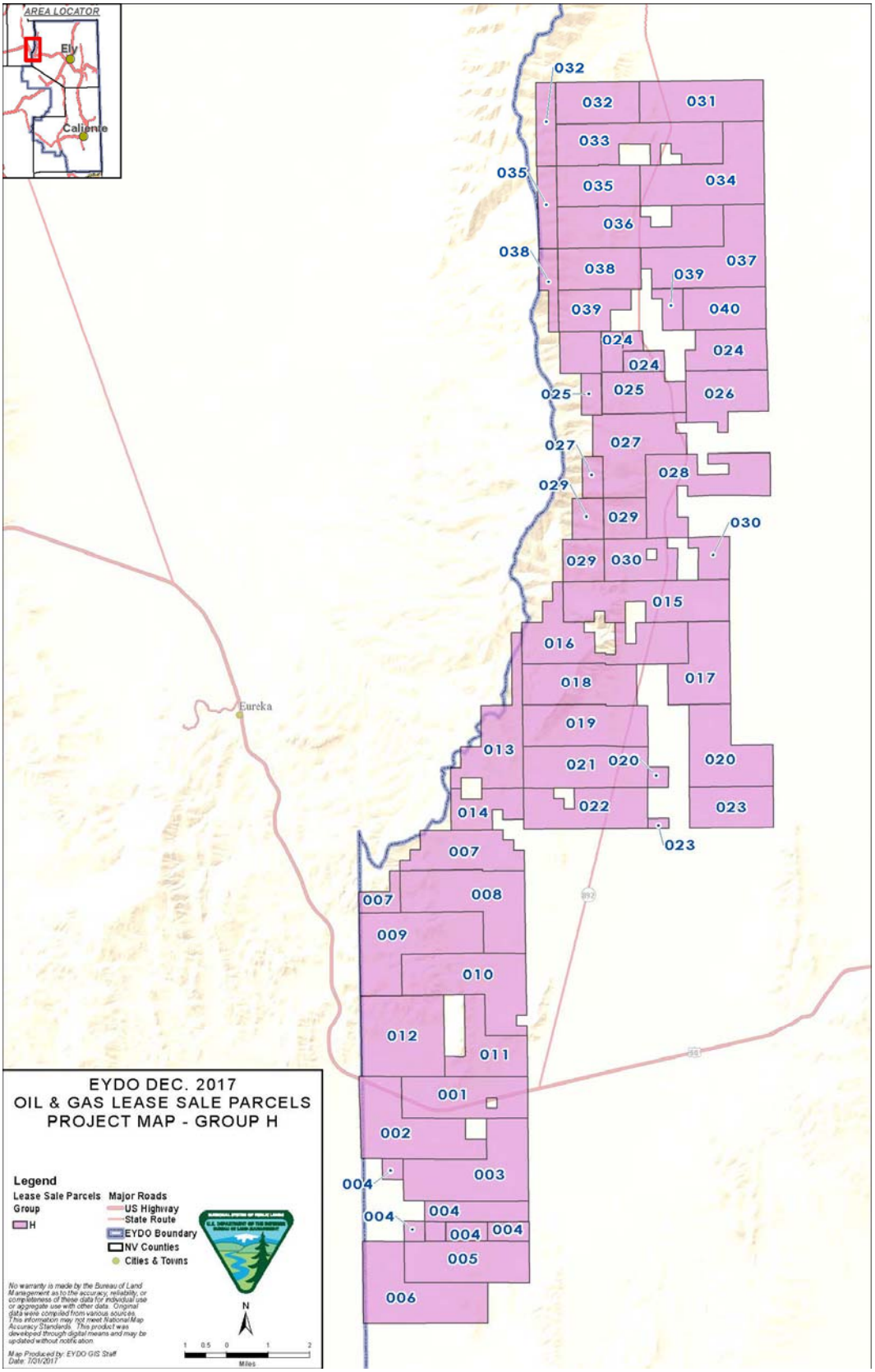
Map 2.7 Ely District Oil & Gas Lease Sale - Parcel Group F



Map 2.8 Ely District Oil & Gas Lease Sale - Parcel Group G



Map 2.9 Ely District Oil & Gas Lease Sale - Parcel Group H



2.2. No Action Alternative

The BLM NEPA Handbook (H1790–1) (BLM 2008a) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means that the Proposed Action would not take place. In the case of a lease sale, this would mean that all expressions of interest to lease (parcel nominations) would be denied or rejected.

Under the No Action Alternative, the BLM would withdraw all 208 lease parcels from the December 2017 lease sale. Surface management would remain the same and ongoing oil and gas exploration and/or development would continue on surrounding leased federal, private, and state lands.

2.3. Alternatives Considered, but Eliminated from Further Analysis

No other alternatives to the proposed action were apparent that would meet the purpose and need of the Proposed Action. No other alternatives were submitted or proposed during the public scoping period.

2.4. Reasonably Foreseeable Development Scenario

A Reasonably Foreseeable Future Development scenario (RFFD) for oil and gas is a long-term projection of oil and gas exploration, development, production, and reclamation activity. The RFFD covers oil and gas activity in a defined area for a specified period of time and provides the basis for the analysis of the environmental effects in Chapter 3 of this document. The RFFD scenario was developed based on past exploration activities and estimates of future exploration and development activity given the potential occurrence of resources (BLM 2007; page 4.18–3).

The RFFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation, or executive order. The RFFD provides the mechanism to analyze the effect that discretionary management decisions have on oil and gas activity. The RFFD also provides the basic information that is analyzed in the NEPA document. The RFFD discloses indirect future or potential impacts that could occur once the lands are leased. Prior to any future development, the BLM would require a site-specific NEPA analysis at the exploration and development stages.

Fluid mineral development potential in the analysis area is based on RFFD scenario for oil and gas developed in conformance with BLM Instruction Memorandum No. 2004–089 (BLM 2004). This analysis is based largely on the reasonably foreseeable development scenarios presented in detail in the fluid mineral report prepared for the RMP/FEIS (ENSR 2004), available at the Ely District Office. Various additional assumptions have been incorporated based on changes in the mineral markets in the recent past. It is impossible to predict with certainty how resource development would occur in the future. The interaction of prices, markets, technology, and environmental concerns all play a role.

The RFFD for the analysis area is based on the geology, oil and gas development history, oil and

gas potential, BLM well data, and data from other EAs for oil and gas leases in eastern Nevada.

The RFFD scenario is made without respect to any existing or proposed leasing stipulations and conditions of approval in accordance with BLM guidance.
The Proposed Action does not include any surface disturbance, such as exploration, development, production, or final reclamation of oil and gas resources. However, the authorization of oil and gas leasing does convey a right to subsequent exploration and production activities subject to stipulations, restrictions from non-discretionary statutes, COAs, and other reasonable measures required to minimize adverse impacts (CFR 3101.1–2). Therefore, this EA would consider possible impacts from potential indirect effects under RFFD scenarios. The following table summarizes the RFFD assumptions in comparison to this EA extrapolated from the RMP.

Table 2.2 Ely RMP Reasonably Foreseeable Future Development Scenarios (RFFD)

Facility Type	Number of Facilities	Short-term Disturbance (acres)	Long-term Disturbance (acres)
Seismic Survey	30 miles/year	<1000	0
Exploration Well Disturbances	200 wells and 1000 miles of road	5600	590
Small Well Field Developments	40 wells	745	359
Large Well Field Developments	100 wells	996	432
Refinery Facilities	1 refinery	65	20
Total		8406	1401

Notes

Short-term applies to effects occurring in the immediate future and persisting for less than 10 years; long-term applies to effects occurring or lasting beyond 10 years (10–20 years).
Summarized from Table 4.18–2 in the Ely RMP/FEIS (2007, page 4.18–5)

2.4.1. General Assumptions for the RFFD Scenario

The following is a list of general assumptions upon which the reasonably foreseeable development scenarios is based (BLM 2007).

- The RFFD would occur over a span of 20 years.
- There would be no major regulatory changes in federal or state statutes, regulations, policy and guidance that govern the exploration and development of fluid minerals, including lease royalty provisions and lease rental fees.
- Oil prices would remain sufficiently high to stimulate continued exploration and drilling. Recent historic highs in the price of oil may stimulate exploration activity above levels of the recent past. It is possible that higher prices may persist for the next few years. The RFFD is a planning tool that was developed to accommodate the maximum development that could reasonably be expected to occur. However, actual activity levels, as with prices, cannot be predicted with certainty.
- It cannot be predicted at this time how much acreage eventually would be held by production, which is entirely dependent on the discovery of commercial oil and gas fields.
- New field discoveries would be similar in size and surface disturbance to the Trap Springs and

Kate Springs oil fields within Railroad Valley.

- The RFFD scenario is made without respect to any existing or proposed leasing stipulations and conditions of approval in accordance with BLM guidance.
- Actual locations of potential exploration wells and field development are unknown. The impacts associated with these activities are likely to occur anywhere within the planning area that is of high, moderate, or even low potential for oil and gas resources.

2.4.2. Geophysical Exploration Assumptions

Within the Ely District, the subsurface geology is not always accurately represented by the surface outcrop, and it is for this reason exploration geologists use geophysical methods to help locate oil and gas traps. Geophysical exploration includes a variety of instruments and techniques, but all geophysical exploration is based on the measurement of one of three physical properties: gravitational field, magnetic field, and seismic reflection characteristics. Of these types, only seismic reflection surveys result in any detectable surface disturbance. Initial geophysical surveys may cross tens of miles in what appear to be a random pattern. These surveys attempt to piece together the local subsurface geology or confirm geologic inference. If real or perceived geologic structures of interest are located, surveys of specific areas would be intense and may be repeated frequently.

The Ely RMP projected that 30 miles of seismic surveys per year at a surface disturbance rate of less than 2 acres per mile would be conducted in the Ely District. If 30 miles of surveys should occur over 20 years, then an average of 1.5 miles of seismic survey totaling 3 acres of surface disturbance can be expected per year under the RFFD scenario.

2.4.3. Exploration Drilling and Production Assumptions

Actual locations of potential exploration wells and field development are unknown. The impacts associated with these activities could occur anywhere within the leased parcels that are of high, moderate, or even low potential for oil and gas resources.

The RMP/FEIS assumes a total of 448 wells would be drilled resulting in total short-term disturbance of approximately 8,400 acres and a long-term (greater than 10 years for producing wells) disturbance of approximately 1,400 acres. Short-term disturbance, as defined for the RFFD scenario, identifies wells to be plugged and abandoned that would be reclaimed immediately after drilling or construction, in accordance with COAs and BMPs. If 448 wells should occur over 20 years, then an average of 22 wells totaling 81 acres of short-term surface disturbance and 33 acres of long-term surface disturbance can be expected per year under the RFFD scenario. Therefore, it is expected that 132 wells should have been drilled since the RMP.

There have been 25 APDs approved by the Ely District over the past 10 years and only 13 have been approved since the ELY RMP was approved in August 2008. Most APD’s in the Ely District propose a single well per pad. Additionally, not every APD approved is actually drilled. Therefore, it would be highly speculative that 438 wells would be drilled over the next 9 years, even with advancements in well stimulation techniques.

Exploration Drilling

The RFFD scenario in the Ely District RMP/FEIS (2007) planned for 200 exploration wells over the life of the RMP that could result in 740 acres of short-term surface disturbance. Under the RMP scenario, approximately 1,000 miles of new roads would be created to access the well pads. This would add another 4,800 acres of short-term surface disturbance (BLM 2007, Table 4.18–2). If this development and associated disturbance is expected over the course of 20 years, then average development and disturbance per year is expected to include 10 exploration wells and 50 miles of new roads resulting in 37 acres and 240 acres of short term surface disturbance respectively.

Typically, constructing the roads and pads, and drilling the well should take less than six months to complete. If the well is a dry hole, then it is plugged immediately before the drill rig leaves the site. Reclamation of the pad and access road takes place once conditions permit, typically within six months of abandoning the well. If the well becomes a producer, then the access road would remain until the well is no longer producing. The pad would be reclaimed to a smaller size necessary to accommodate production operations.

Production

The average geographic area for a producing oil and gas field in the United States is about 640 acres. Field sizes tend to be smaller in Nevada. There would be 40–acre spacing for wells less than 5,000 feet in depth and 160–acre spacing for wells deeper than 5,000 feet. Most wells drilled in Nevada are deeper than 5,000 feet, so well spacing would probably be 160 acres.

The RFFD scenario in the RMP/FEIS planned for six new production well fields within the Ely District; four small fields and two large fields. The four small well fields would be comprised of 88 wells, 40 being producing wells and the other 48 being plugged and abandoned. The two large well fields would be comprised of 160 wells, 100 being producing wells and the other 60 being plugged and abandoned. This RFFD also included a total of 56 miles of new access and service roads, and eight miles of new pipelines for the small well fields. The two large well fields would include an overall total of 55 miles of new access and service roads, and 10 miles of new pipelines. A projection of adding a new refinery to the area was also included in this RFFD (BLM 2007, Table 4.18–2).

Well fields can take a number of years to develop and occupy various acreages. Therefore it cannot be broken down into an average number of well field development per year. Furthermore, the Ely District only has one well field (located on in Railroad Valley with only 2 producing wells). It is possible however, that some of the individual parcels nominated, individually or as adjacent leases, could support well field development.

Well Stimulation

Well stimulation may be used to enhance oil recovery of developed wells. Several methods of well stimulation could be used to increase the yield of a well. Hydraulic fracturing is the process of applying high pressure fluids to a subsurface formation via a wellbore, to the extent that the pressure induces fractures in the rock. These fractures allow the oil and gas to migrate, or flow, into the well. Without the fracturing of the formation, the oil and gas contained in the rock would be too tightly trapped to flow into the well. Development of hydraulic fracturing methods and the drilling technology in which it is applied (in particular, long wells drilled horizontally within

zones of interest) have enabled production of oil and gas from tight formations formerly not economically feasible.

In order to mitigate potential environmental impacts from hydraulic fracturing methods, the following list of mitigation measures would be required. Additional analysis would be conducted when an APD is submitted to determine the site-specific issues, the need for additional BMPs and COAs, and if hydraulic fracturing can be conducted without causing undue and unnecessary degradation per 43 CFR 3100.

Wells are cased multiple times and sealed with cement between the wellbore and the formation. Well integrity is tested throughout the process.

Drilling and hydraulic fracturing fluids would either be contained in a pit-less system (above ground tanks) or a lined pit. Cuttings could be contained in roll-off boxes for hauling to disposal or surface casing interval cuttings could be spread over the site during reclamation.

Hydraulic fracturing fluids may be returned to the surface as “flowback” or produced water when the well is tested or produced.

All recovered fluids are generally handled by one of four methods: (1) underground injection; (2) captured in steel tanks and disposed of in an approved disposal facility; (3) treatment and reuse; or (4) surface disposal pits.

A detailed discussion of hydraulic fracturing is found in Appendix E.

Chapter 3 Affected Environment/Environmental Impacts

3.1. Introduction

This chapter presents the existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area, the issues analyzed, the impacts to the analyzed resources, and mitigation that could be applied that would reduce those impacts. Mitigation proposed in this section could be included in the FONSI to prevent potentially significant impacts. Application of the mitigation measures to the proposed action would then be carried forward into the Decision Record as a condition of approval of the proposal.

While many potential issues may arise during scoping, not all of them warrant analysis. Issues raised through scoping are analyzed if:

Analysis of the issue is necessary to make a reasoned choice between alternatives.

The issue is significant (e.g. an issue associated with a significant impact, such as a potential violation of a law imposed to protect the environment).

Analysis of the issue is necessary to determine if the direct or indirect impacts are themselves significant, or if it would add a measurable incremental impact to past, present and reasonably foreseeable actions that could have a cumulatively significant impact.

Potential impacts to the following resources/concerns were evaluated in accordance with criteria listed above to determine if detailed analysis was required. Consideration of some of these items is to ensure compliance with laws, statutes or Executive Orders that impose certain requirements upon all Federal actions. Other items are relevant to the management of public lands in general, and to the Ely District BLM in particular.

Many times a project would have some degree of effect upon a resource or concern, but that effect doesn't approach any threshold of significance, nor does it increase cumulative impacts by a measurable increment. Such effects are described as "negligible" in the rationale for dismissal from analysis.

The following table documents the issues evaluation or rationale for dismissal from analysis:

Table 3.1 Identification of Issues for Analysis

Resource/ Concern	Issue(s) Analyzed? (Y/N)	Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis (Grouped in accordance with the format of the Ely RMP)
Air Quality* and Climate Change	Y	There are no direct impacts to air quality associated with leasing, since there isn't any surface disturbance. However, there is a potential for direct impacts associated with lease development activities that could potentially affect air quality. Those potential direct impacts are analyzed in this EA.
Water Resources (Water Rights, Water	Y	Analyzed in Potentially Affected Resources and Environmental Effects sections due to potential impacts

Quality, Floodplains, and Wetlands/Riparian Zones*)		
Farmlands, Prime and Unique*	N	Resource is not present on the nominated parcels.
Soils/Watershed	N	Within the State of Nevada, a MOU for exploration and mining reclamation exists between the BLM and the Nevada Division of Environmental Protection. Reclamation permits are supported by site-specific reclamation plans which are submitted and maintained according to an agency review and approval process. If approved, a permit defines post-project land uses, growth media salvage and replacement, seedbed amendments and erosion controls, site drainage, public safety provisions, roads, re-contouring and revegetation practices, post-treatment monitoring, and other site restoration considerations according to best management practices. As a result, and given the comparatively small extent of mineral exploration and extraction acreage in the analysis area, the effects of these activities on soil resources are expected to be minimal.
Forest Health*	N	Project does not meet HFRA criteria.
Vegetation, Forest/ Woodland and other vegetative products (Native seeds, yucca and cactus plants) and Wetlands/Riparian Zones*	N	Vegetative resources are covered in Section 3.3.11 Grazing Uses/Forage. Wetlands and riparian areas exist within some proposed parcels; potential impacts are covered in Section 3.3.2 Water Resources.
Fish and Wildlife	Y	Analyzed in Potentially Affected Resources and Environmental Effects sections due to potential impacts.
Migratory Birds*	N	A Lease Notice regarding the Migratory Bird Treaty Act has been included on all parcels. **Migratory Bird Treaty Act** The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing one of the following measures: a) avoidance by timing - ground disturbing activities would not occur during the breeding bird season; b) habitat manipulation - render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds; blading or pre-clearing of vegetation must occur prior to the beginning of the breeding season within the year and area scheduled for activities during the breeding season of that year to deter nesting; or c) survey area monitoring– surveys would be conducted by a BLM approved biologist within the area of the proposed action including an appropriate-sized survey area from the proposed project footprint during the breeding season if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within an appropriate-sized buffer determined in coordination with the BLM biologist. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports would be submitted to the appropriate BLM Office. Long-term population trends of migratory birds would not be impacted by the leasing of parcels. If drilling were to occur during the nesting season, parcels would be

		surveyed prior to exploration to prevent potential effects to nesting migratory birds. This would comply with the provisions of the Migratory Bird Treaty Act (MBTA). A detailed analysis is not required.
USFWS Listed (or proposed for listing) Threatened or Endangered Species or critical habitat.	Y	Analyzed in detail.
Special Status Animal Species, other than those listed or proposed by the USFWS as Threatened or Endangered.	Y	Analyzed in detail due to the presence of several special status animal species within proposed parcels.
Special Status Plant Species, other than those listed or proposed by the USFWS as Threatened or Endangered.	Y	Analyzed in detail.
Wild Horses	N	No impacts to wild horses would occur from leasing. If parcels are later developed, impacts could result in surface disturbance and forage availability within the HMAs/HAs. Springs exist in and near parcels. Should exploration or development be proposed within these lease parcels, additional, site-specific NEPA analysis would be completed to assess the potential impacts to wild horses and their habitat. At the APD stage, COAs for development within HMAs would reduce impacts. For example: flagging all new fences, road signs for safety, and water resource mitigation measures.
Cultural Resources *	Y	Analyzed in detail.
Heritage Special Designations (Historic Trails, Archaeological Districts and Areas, and ACEC's designated for Cultural Resources)	Y	Analyzed in detail. Historic Trails are present within or near several of the proposed parcels.
Paleontological Resources	N	A BLM records search was conducted on the project parcels that revealed no known paleontological resources present that have special research interest or importance to the general public. Further analysis is not required.
Visual Resources	Y	Analyzed in detail in order to apply stipulations to leased parcels that would mitigate impacts to viewshed qualities.
Land Uses	Y	Analyzed in detail. Several active right-of-ways exist on the proposed parcels..
Transportation/ Access	N	Transportation access would not be affected at the lease stage. Potential impacts to transportation routes would be considered in detailed NEPA analysis at the APD stage.
Recreation Uses including Back country Byways, Caves, Rockhounding Areas	N	Leasing would not restrict access to recreation resources or activities. Detailed NEPA analysis would occur if development were to occur on leased parcels.
Grazing Uses/Forage	Y	Analyzed in detail due to the open-range nature of grazing on proposed parcels.

Mineral Resources	Y	Analyzed in detail due to presence of active mining claims within proposed parcels.
Fuels	N	The Proposed Actions are limited to leasing and there are no authorizations for ground disturbing activity associated with issuing the lease. Therefore, there is no need for detailed analysis of Fuels or Fire Management. Impacts from exploration and development activities would be analyzed under a separate, site specific analysis when an APD is submitted.
ES&R	N	The resource would not be affected by the proposed actions.
Non-Native Invasive and Noxious Species *	Y	Noxious and invasive species are documented within the parcel areas. See the attached Weed Risk Assessment in Appendix J for a list of specific species in these areas and potential impacts.
Swamp Cedar and Blue Mass ACEC's (Schell)*	N	No proposed parcels overlap these ACECs. Not present.
Wilderness/ WSA*	N	Oil and gas leasing is not allowed in wilderness or WSAs. Not present.
Lands with Wilderness Characteristics	Y	Analyzed in detail due to the wilderness characteristics found on some parcels.
Wild and Scenic Rivers	N	Not present.
Human Health and Safety*	N	Human health and safety would not be affected by the proposed actions because no activity is authorized at this time. Additional NEPA would be required if development is proposed.
Native American Religious and other Concerns*	Y	Analyzed in detail. There are Native American populations within close enough distance to some proposed sale parcels to warrant special scrutiny.
Wastes, Hazardous or Solid*	N	After reviewing the proposed actions and the most current electronic GIS data, there does not appear to be any concerns or issues with solid or hazardous wastes. Activities that may contribute or create solid or hazardous wastes are not authorized at this time and would require additional NEPA if development is proposed.
Public Safety	N	Activities that may affect public safety are not authorized at this time and would require additional NEPA if development is proposed.
Environmental Justice*	N	The lease sale does not authorize any surface disturbing activity and therefore, would not disproportionately affect the health or environmental for minority populations. Additional analysis would be required if the parcels are leased and proposed to be explored or developed.
Socioeconomics	N	In the case of a lease sale, there is no economic and no social impact from the action. Should those leases lead to exploration and, in turn, production, those actions would need to be analyzed for potential socioeconomic impacts.

*Supplemental Authority

3.2. General Setting

There are no known oil reserves within any of the proposed parcel areas. The oil-bearing formations sought in White Pine, Lincoln, and Nye Counties are primarily the Chainman and Pilot shales. Devonian-age subthrust structures, thought to be present in some valleys within the analysis area, are also targeted. The nominated parcels have been separated into 8 groups by geographic area and similar resource concerns (see Chapter 2 Tables and maps). The total area of all the parcels is approximately 388,960 acres.

Group A or Tule Desert Area is located entirely within southeast Lincoln County and entirely within the Caliente Field Office boundary. The group contains 10 parcels totaling 16,453.106 acres. These parcels occur within the Mojave Desert ecosystem. No known exploration wells have been drilled in this region of Nevada, but geophysical exploration has been authorized in the past.

Group B or Hiko Area is located entirely in Lincoln County and contains 53 parcels totaling 94,945.603 acres. These parcels are just outside the Basin and Range National Monument established in 2015.

Group C or White River Valley is located in northeast Nye and southwest White Pine counties, is completely within Bristlecone Field Office, and contains 21 parcels totaling 33,754.640 acres. Only six parcels occur entirely in White Pine County and three overlap the county boundary.

Group D or Railroad Valley is located entirely within Nye County except for one parcel and is entirely within the Bristlecone Field Office., and the group has 49 parcels totaling 90,086.023 acres. These parcels occur within the Great Basin ecosystem and are southwest of the Duckwater Reservation.

Group E is located north of Group C, also in the White River Valley. Group E is near the town of Lund and is entirely within Nye County. The parcel group contains 26 parcels and 53,543.630 acres.

Group F consists of 8 parcels covering 18,060.850 acres near the Nevada/Utah border in White Pine County. Highway 50 runs through the middle of the parcel group.

Group G contains only one parcel of 2,023.480 acres in central White Pine County, northwest of Ely. Highway 50 runs through the parcel.

Group H is located entirely in western White Pine County, along the White Pine/Eureka boundary. These parcels are adjacent to parcels offered in the June 2017 Battle Mountain Lease Sale and contains 40 parcels covering 80,092.070 acres.

3.3. Resources/Concerns Analyzed

The following sections evaluate resources for the potential for significant impacts to occur, either directly or indirectly, due to implementation of the proposed action. Potential impacts were evaluated to determine if detailed analyses were required. Consideration of some of these items is to ensure compliance with laws, statues or Executive Orders that impose certain requirements upon all federal actions. Other items are relevant to the management of public lands in general, and to the Ely District in particular. Table 3.1 lists any resources and rationale for not being carried forward for analysis as well as those that are carried forward.

At the time of this review, it is not known whether all nominated parcels would be offered for lease, would receive bids, would be issued leases, or what type of exploration or development would be proposed in the future. Detailed site-specific analysis of individual pads, wells, or roads would occur when an APD is submitted.

3.3.1. Air Quality and Climate Change

Affected Environment

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). Exposure to air pollutant concentrations greater than the NAAQS has been shown to have a detrimental impact on human health and the environment. The EPA has delegated regulation of air quality under the federal Clean Air Act to the State of Nevada. In addition to the criteria pollutants, regulations also exist to control the release of hazardous air pollutants (HAPs). HAPs are chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA currently lists 188 identified compounds as hazardous air pollutants, some of which can be emitted from oil and gas development operations, such as benzene, toluene, and formaldehyde. Ambient air quality standards for HAPs do not exist; rather these emissions are regulated by the source type, or specific industrial sector responsible for the emissions.

Ambient air quality in the affected environment is demonstrated by monitoring for ground level (i.e. receptor height) atmospheric air pollutant concentrations. In general, the ambient air measurements show that existing air quality in the region is good. Concentrations for all the criteria pollutants are below the applicable state and federal ambient air quality standards. For more information on pollutant monitoring values, including the other criteria pollutants not shown below, please visit the EPA's AirData website at www.epa.gov/airdata.

There is broad scientific consensus that humans are changing the chemical composition of our atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accelerated accumulation of greenhouse gasses (GHGs), such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and several industrial gases, in our atmosphere. An increase in GHG emissions is said to result in an increase in the earth's average surface temperature, primarily by trapping and decreasing the amount of heat energy radiated by the earth back into space. The phenomenon is commonly referred to as "global warming". Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, precipitation rates, etc., which is commonly referred to as "climate change". The Intergovernmental Panel on Climate Change (IPCC) has predicted that the average global temperature rise between 1990 and 2100 could be as great as 5.8°C (10.4°F), which could have massive deleterious impacts on the natural and human environments. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, from approximately 280 ppm in 1750 to 400 ppm in 2015 (as of May). The rate of change has also been increasing as more industrialization and population growth is occurring around the globe. This fact is demonstrated by data from the Mauna Loa CO_2 monitor in Hawaii that documents atmospheric concentrations of CO_2 going back to 1960, at which point the average annual CO_2 concentration was recorded at approximately 317 ppm. The record shows that approximately 70% of the increases in atmospheric CO_2 concentration or build up, since pre-industrial times, have occurred within the last 50 years.

Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a standard period of 30 years. Climate change includes both

historic and predicted climate shifts that are beyond normal weather variations.

Environmental Effects

Proposed Action

While the act of leasing the parcels would produce no substantial air quality effects, potential future development of the leases could lead to increases in area and regional emissions. Since it is unknown if the parcels would be developed, or the extent of the development, it is not possible to reasonably quantify potential air quality effects through dispersion modeling or another applicable method at this time. Further, the timing, construction and production equipment specifications and configurations, and specific locations of activities are also unforeseeable at this time. Additional air effects would be addressed in a subsequent analysis when lessees file an APD. All proposed activities including, but not limited to, exploratory drilling activities would be subject to applicable local, State, Tribal and Federal air quality laws and regulations.

The Bureau of Land Management National Operations Center (NOC) retained the Kleinfelder Team (which consisted of staff from Kleinfelder, Inc. and ENVIRON International Corporation) to prepare an emissions inventory estimate of criteria pollutants, greenhouse gases, and key hazardous air pollutants for representative oil and gas wells in the western United States (US). The emissions inventory was designed to be used by BLM staff, such as NEPA planners, air resource specialists, and natural resource specialists, to evaluate emissions from small oil and gas projects, which for purposes of this inventory is approximately five wells or less.

Defining a "representative" oil and gas well for the entire western US was extremely challenging as there are numerous variables, even within a single basin and sub basin, that can materially affect the emissions. Such variables include oil and gas composition, difficulty drilling the geologic formation, oil and gas production rate, equipment at the well site, emission controls, produced water that may be associated with oil and gas production, among many others.

Accordingly, to develop such an inventory, five different well types (three natural gas wells and two oil wells) representative of five different major oil and gas basins in the western US were evaluated. In order to develop the emission inventories, information that is not proprietary, not draft, and not pre-decisional was reviewed for the five selected basins plus other oil and gas developments in the western US. The characteristics of the five basins selected are similar to a large portion of the oil and gas produced in the western United States. The following table is taken from this March 2013 report (Erbes, Air Emissions Inventory Estimates for a Representative Oil and Gas Well in the Western United States). The Reasonably Foreseeable Development Scenario developed for this lease EA is a maximum of 100 wells drilled within the parcels in the Ely District. The number of holes that could be drilled in any given area is unknown but potential emissions would be multiplied appropriately.

Table 3.2 Air emissions inventory based on five western basins for estimating emissions for a representative oil and gas well in the western United States

Well Type	**Gas**	**Gas**	**Gas**	**Oil**	**Oil**
Basin Pollutant (tons per year)	Uinta/Piceance	Upper Green River	San Juan	Williston	Denver
NO_X	15.6	14.6	5.6	15.6	6.3

CO	3.8	3.9	3.1	8.0	3.4
VOC	3.4	5.2	5.3	17.6	6.7
SO_2	0.0004	0.0004	0.001	0.001	0.001
PM_{10}	6.9	6.7	6.8	6.9	6.6
$PM_{2.5}$	0.8	0.8	0.5	0.8	0.5
CO_2	2,552.1	2,552.1	651.0	3156.4	1,049
CH_4	12.2	14.1	6.1	16.6	1.8
N_2O	0.05	0.05	0.04	0.6	0.04
GWP	2,825	3,194	791	3,682	1,099
Benzene	1.4	1.5	1.4	1.5	1.4
Toluene	1.0	1.2	1.0	1.0	1.0
Ethybenzene	0.00003	0.01	0.0008	0.0008	0.0006
Xylene	0.6	0.7	0.6	0.6	0.6
n-Hexane	7.5	7.5	7.5	7.9	7.5
Total HAPs	10.4	10.9	10.5	11.0	10.5

Note: Sums may not precisely total due to rounding off differences. A value of 0.00 indicates that pollutant is not emitted or emitted in *de minimis* amounts. If there is a non-zero value, at least one significant figure is reported. Greenhouse gas emissions are in terms of short tons CO_2, CH_4, and N_2O. Global Warming Potential (GWP) is in terms of short tons of CO_2 equivalent (CO_2e), using a GWP of 1 for CO_2, 21 for CH_4, and 310 for N_2O.

Any subsequent activity authorized after APD approval could include soil disturbances resulting from the construction of well pads, access roads, pipelines, power lines, and drilling. Any disturbance is expected to cause increases in fugitive dust and potentially inhalable particulate matter (specifically PM_{10} and $PM_{2.5}$) in the project area and immediate vicinity. Particulate matter, mainly dust, may become airborne when drill rigs and other vehicles travel on dirt roads to drilling locations. Air quality may also be affected by exhaust emissions from engines used for drilling, transportation, gas processing, compression for transport in pipelines, and other uses. These sources would contribute to potential short and long term increases in the following criteria pollutants: carbon monoxide, ozone (a secondary pollutant, formed photochemically by combining VOC and NO_X emissions), nitrogen dioxide, and sulfur dioxide. Non-criteria pollutants (for which no national standards have been set) such as carbon dioxide, methane, nitrous oxide, air toxics (e.g., benzene), and total suspended particulates (TSP) could also be emitted. Certain pollutants may be significant when evaluating air quality related values (AQRVs) for effects on visibility and atmospheric deposition. Significance would depend greatly on the proximity to sensitive receptors, area meteorology, and the background levels of an AQRV at any sensitive receptor. Dust control measures, such as applying a layer of gravel over the travel surfaces, watering travel surfaces, and reducing speed along the roadways can be very effective in mitigating dust issues.

During exploration and development, ‘natural gas’ may at times be flared and/or vented from conventional, coal bed methane, and shale wells. The gas is likely to contain volatile organic compounds that could also be emitted from reserve pits, produced water disposal facilities, and/or tanks located at the site. The development stage may likely include the installation of pipelines for transportation of raw product. New centralized collection, distribution and/or gas processing facilities may also be necessary. The decision to offer the identified parcels for lease would not result in any direct emissions of air pollutants. However, any future exploration or development of these leases would result in emissions of criteria, HAP and GHG pollutants. The additional emissions could result in an incremental increase in overall emissions of pollutants in the region depending on any contemporaneous activities occurring at the same time when

potential exploration and development occurring on the lease would happen.

The BLM encourages industry to incorporate and implement BMPs to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. In accordance with a recent BLM Memorandum of Understanding (MOU) regarding air quality analysis and mitigation, the BLM would coordinate with the Environmental Protection Agency (EPA) early in the APD process to determine how best to model and mitigate for impacts to air quality. Measures may also be required as COAs on permits by either the BLM or the applicable state air quality regulatory agency. The BLM also manages venting and flaring of gas from federal wells as described in the provisions of Notice to Lessees (NTL) 4A, Royalty or Compensation for Oil and Gas Lost.

Some of the following measures could be imposed at the development stage:

- Flaring or incinerating hydrocarbon gases at high temperatures to reduce emissions of incomplete combustion;
- Emission control equipment of a minimum 95 percent efficiency on all condensate storage batteries;
- Emission control equipment of a minimum 95 percent efficiency on dehydration units, pneumatic pumps, produced water tanks;
- Vapor recovery systems where petroleum liquids are stored;
- Tier II or greater, natural gas or electric drill rig engines;
- Secondary controls on drill rig engines;
- No-bleed pneumatic controllers (most effective and cost effective technologies available for reducing VOCs);
- Gas or electric turbines rather than internal combustions engines for compressors;
- NO_x emission controls for all new and replaced internal combustion oil and gas field engines;
- Water dirt and gravel roads during periods of high use and control speed limits to reduce fugitive dust emissions;
- Interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.
- Co-located wells and production facilities to reduce new surface disturbance;
- Directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores;
- Gas-fired or electric pump jack engines;
- Velocity tubing strings;
- Cleaner technologies on completion activities (i.e. green completions), and other ancillary sources;
- Centralized tank batteries and multi-phase gathering systems to reduce truck traffic;
- Forward looking infrared (FLIR) technology to detect fugitive emissions; and,
- Air monitoring for NO_x and ozone.

No Action Alternative

No Action Alternative would have no impacts on the existing air quality and climate change in the area. Activities on currently leased parcels adjacent to the proposed parcels would still be permitted.

3.3.2. Water Resources (including Water Rights, Water Quality, Floodplains, Wetlands/Riparian Zones)

Ground water and surface water conditions are described in Section 3.3 of the Ely RMP/FEIS. Trends and current management of ground water, surface water, water rights, and water quality are indicated.

Affected Environment

Hydrographic Basins

The hydrographic basin is the basic management unit used by the Nevada Division of Water Resources (NDWR). Hydrographic basins are part of larger hydrographic flow regions. Table 3.3 identifies the hydrographic basin numbers, basin names, and hydrographic flow regions in which the lease parcels are located. There are basins in the lease area that are designated as closed to particular beneficial uses, typically due to perennial yields and the number of appropriations as of August, 2017 from the NDWR website (NDWR ,2017).

Table 3.3 also shows the groundwater demands and estimated perennial yield in the analysis area (per hydrographic areas). Many of these hydrographic areas are designated basins, indicating that the NDWR would closely monitor future groundwater use and may not issue new groundwater permits. The proposed lease parcels are located in the Central, the Great Salt Lake Basin, and the Colorado River Basin hydrographic regions. Table 3.4 provides a summary of the 2017 proposed lease area.

Table 3.3 Hydrographic Basin Summary

Basin #	Basin Name	Hydrographic Region	Designated Basin (Y/N)[a]	Perennial Yield (Acre-Feet/ Year)	Groundwater Appropriations (Acre-Feet/ Year)
154	Newark Valley	Central	N	18,000	27,649
155A	Little Smoky Valley, Northern Part	Central	N	5,000	5,056
170	Penoyer Valley (Sand Spring Valley)	Central	Y (Order No. 712)	4,000	15,083
173A	Railroad Valley (Southern Part)	Central	N	2,800	3,931
173B	Railroad Valley (Northern Part)	Central	N	75,000	31,770
179	Steptoe Valley	Central	Y (Order No. 731)	70,000	118,622
181	Dry Lake Valley	Central	N	15,000	12,631
182	Delamar Valley	Central	N	6,100	6,049
184	Spring Valley	Central	N	84,000	81,813
195	Snake Valley	Great Salt Lake Basin	N	25,000	11,841

207	White River Valley	Colorado River Basin	Y (Order No. 1219)	37,000	35,466
208	Pahroc Valley	Colorado River Basin	N	21,000	39
209	Pahranagat Valley	Colorado River Basin	Y (Order No. 1199)	25,000	10,744
221	Tule Desert	Colorado River Basin	N	2500	5,004
222	Virgin River Valley	Colorado River Basin	Y (Order No. 753)	3,600	12,449

[a]Designated groundwater basins are basins that the Nevada State Engineer (NSE) declares as designated by order because permitted groundwater rights approach or exceed the average annual recharge, and where the water resources are being depleted or require additional administration. State-declared preferred uses may include, among others, municipal, domestic, and/or agriculture. The NSE has additional authority to administer water resources in a designated groundwater basin.

Table 3.4 Hydrographic basins in which proposed leases are located

Parcel Group	Parcel Acreage	Basin Number(s)[a]
A	13,480	221 and 222
B	96,447	170, 181, 182, 208, and 209
C	35,595	207
D	89,622	173B
E	53,864	207
F	18,061	184 and 195
G	2,023	179
H	80,098	154 and 155A

Listed parcel acreages are the total number of acres as distributed across the given basins.

Regulatory Background

Objectives for Water Resources and Water Quality are listed in the Ely RMP. The Ely RMP requires that authorized activities on public lands do not degrade water quality. This includes compliance with the Clean Water Act and Nevada Water Pollution Control Regulations (Nevada Revised Statute 445A) and compliance with the Memorandum of Understanding between the BLM and Nevada Division of Environmental Protection, dated September 2004. RMP objective WR-2 also requires the integration of land health standards, best management practices, and appropriate mitigation measures into authorized activities to ensure water quality meets state requirements and BLM resource management objectives in BLM Manual 7240. Additionally, any water used for exploration or production of oil and gas resources would need to be in compliance with BLM Manual 7250 and Nevada Water Law to ensure that the use does not to impact other water right holders.

Groundwater

Groundwater conditions are described in Section 3.3 of the Ely RMP/FEIS. There are two major aquifer types throughout the Great Basin that supply ground water; alluvium aquifers and carbonate bedrock aquifers. The alluvium aquifers are relatively shallow and are composed of unconsolidated Quaternary and Tertiary sediments eroded from elevated rock exposed in the mountain ranges and transported into the valleys by water and gravity. These aquifers exist in all of Nevada's drainage basins and are known as the Great Basin alluvial aquifer system (Heilweil and Brooks, 2011). Tertiary volcanic rocks underlie the basin fill sediments and locally form a third aquifer type (Welch, et al., 2007)

The carbonate bedrock aquifers are deeper and underlie the basin alluvium, and are composed of limestone and dolomite that formed from the accumulation of calcium carbonate on shallow, gently sloping continental shelf surfaces during separate episodes of the lower and upper Paleozoic Era (Welch, et al., 2007). Carbonate rocks laid down during the lower Paleozoic (Devonian to Cambrian) make up what is known as the lower carbonate aquifer unit. These lower carbonate rocks are separated from carbonates laid down much later in the Pennsylvanian to Permian periods called the upper carbonate aquifer unit. The rocks that separate the upper and lower carbonate aquifer units were deposited during the Mississippian period, forming a low-permeability rock layer called the upper siliciclastic confining unit. The extensive carbonate bedrock formations make up what is known as the Great Basin regional carbonate aquifer system as these rocks underlie much of the Great Basin of eastern Nevada and western Utah (Eakin, 1963).

The regional carbonate aquifer system is not extensively utilized due to its infrequent accessibility. In places, groundwater pathways exist between the deeper carbonate bedrock aquifers and the overlying unconsolidated basin-fill aquifers; therefore pumping in the alluvial system can influence groundwater flow in the carbonate system.

Depths of these aquifer systems can vary throughout the project area. The combined thickness of the carbonate-rock aquifer system typically is greater than 20,000 feet, however, there is uncertainty regarding the depth of the groundwater flow within the carbonate-rock aquifer system (Plume 1996; BLM 2012). The thickness of the basin-fill deposits ranges from zero at the valley margin to several thousands of feet along the axis of the valley. In some valleys the thickness of the basin-fill locally exceeds 10,000 feet (BLM 2012).

The RMP/FEIS summarizes water availability in the shallow alluvial aquifers (Basins) of the analysis area. The perennial yield values shown in Table 3.3-1 of the RMP/FEIS were derived by the State of Nevada to estimate the water in shallow alluvial aquifers that can be withdrawn without creating substantial drawdown in the water table. Perennial yield is a hydrologic concept; it generally is about equal to the estimated net annual recharge. It should be noted that values for perennial yields are subject to change, and represent estimates from NDWR which are periodically updated. Other values exist from other sources. Additional investigations of perennial yield and potential pumping effects were undertaken for water development projects and NEPA actions involving the analysis area (BLM 2012).

The committed resources represent the total volume of permitted, certificated, and vested groundwater rights recognized by the Nevada Division of Water Resources in each basin. Groundwater quality in shallow alluvial aquifers of the analysis area is highly variable.

Evapotranspiration by phreatophytic plant communities accounts for a significant consumption of groundwater recharge resources. Consumptive use of soil moisture and groundwater by plant transpiration is one of the major factors affecting water availability in the analysis area (BLM 2007).

Group A

Parcels in Group A are located in the Tule Spring Hills in the Tule Desert (221) and the Virgin River Valley (222) hydrographic basins of southeast Lincoln County. Surficial Hydrogeologic units include Quaternary upper alluvium aquifer basin fill, Tertiary lower alluvium aquifer basin fill, Tertiary volcanic rocks, Permian to Pennsylvanian rocks of the upper carbonate aquifer unit, and Devonian to Cambrian rocks of the lower carbonate aquifer unit. The regional subsurface flow is thought to move generally in a southeastward direction out the Death Valley Basin and southward through the Colorado River Basin into the area where the group A parcels located (Harrill and Prudic, 1998).

Group B

The majority of the group B parcels are located in hydrographic area 209 (Pahranagat Valley), with portions of these parcels in hydrographic areas 182 (Delamar Valley) and the southern end of 208 (Pahroc Valley). Separate subgroups of the group B parcels are located in 170 (Penoyer Valley) and the eastern south-central part of 208. Hydrogeologic units at the surface include Quaternary upper alluvium aquifer basin fill, Tertiary lower alluvium aquifer basin fill, Tertiary volcanic rocks, Missippian rocks of the upper siliciclastic confining unit, and Devonian to Cambrian rocks of the lower carbonate aquifer unit. The regional subsurface flow is thought to move generally in a southeastward direction out the Death Valley Basin and southward through the Colorado River Basin hydrographic region into the area where the Group A parcels are located (Harrill and Prudic, 1998).

The USGS completed the Regional Aquifer-System Analysis (RASA) for the Great Basin study in 1998. This study developed a regional base of information to improve understanding of the flow system of the Great Basin of Nevada and western Utah, hydraulic properties of the associated aquifers and the functioning of multi-basin flows. Two subsequent USGS studies, Heilweil and Brooks 2011 (Heilweil and Brooks, 2011) and Brooks et al 2014 (Brooks et al., 2014), reviewed and updated the original RASA analysis. Generally speaking, regional groundwater flow through group B parcel area conforms with the general north to south flow direction of the Colorado River Basin.

A Hydrographic Basin of Concern is a basin that the U.S. Fish and Wildlife Service (FWS) has recommended to the Ely District for closure to oil and gas. The FWS designates basins as such if the water flowing in the basin feeds habitat that sustains species listed under the Endangered Species Act (ESA). Hydrographic basin 209 (Pahranagat Valley) has been designated as a Basin of Concern because of the presence of listed fish species associated with basin springs and surface water bodies. A few of the group B parcels have portions of parcels that lie both inside and outside the Basin of Concern boundary, and subgroups of these parcels that lie in basins outside this zone. Parcels within the boundaries of a Basin of Concern will not be offered for lease until the FWS issues a biological opinion following a period after an Ely District formal consultation with the FWS.

Groups C and E

Parcel groups C and E are located in basin 207 (White River Valley). Surficial hydrogeologic units in this area predominantly include the Quaternary and Tertiary basin fill aquifer units. The lower carbonate aquifer unit is mapped along the valley margins to the east and west of parcel group C, as well as along the east valley margin near parcel group E. Tertiary volcanics, along with the upper siliciclastic confining unit are mapped to the west of parcel group E. Regional ground water flows through the area of groups C and E generally from north to south, in the Colorado River Basin.

White River Valley is a FWS Basin of Concern due to the presence of ESA listed fish species in basin springs and at the Nevada Department of Wildlife Kirsch Wildlife Management Area (WMA). Oil and gas lease stipulation #NV-L-09-J-NSO in Appendix A.2 of the Ely RMP/FEIS, as amended in 2015, prohibits any surface occupancy for oil and gas in natural, scenic, and recreation sites, including the Kirsch WMA.

Group D

The parcels of group D are located in basin 173B (Railroad Valley, Northern Part). Hydrogeologic units in the group D area include the Quaternary and Tertiary basin fill aquifer units, with Tertiary volcanics and minor expressions of the lower carbonate aquifer unit to the east and west. Groundwater flow through the group D area is generally from north to south within the Central Hydrographic Region, with some southeasterly flow components (Harrill and Prudic, 1998). Railroad Valley North is also proposed as a FWS Basin of Concern for the presence of ESA listed fish species.

Group F

Group F parcels straddle State Highway 6, with approximately half of the parcels in basin 184 (Spring Valley), and approximately half in basin 195 (Snake Valley). Hydrogeologic units in the group F area at the surface are dominantly the lower carbonate aquifer unit with exposures of a much older Precambrian siliciclastic confining unit known as the lower siliciclastic confining unit. Minor areas of the upper carbonate aquifer rocks are mapped in the northern portion of the parcel area. Regional groundwater is shown to flow in a southwesterly direction in the area of the group F parcels in basin 184 which is in the Central Region, and to the north and northeast in basin 195, which is in the Great Salt Lake Basin. The parcels and portions thereof that lie in basin 184 lie in an FWS Basin of Concern. Those that lie in basin 195 are outside this zone.

Group G

Group G parcels are located in basin 179 (Steptoe Valley) to the northwest of Ely, NV. Mapped surficial hydrogeologic units are dominantly rocks of the upper carbonate aquifer unit, along with basin fill aquifer sediments and Tertiary volcanic rocks. Regional groundwater flow in this area is shown as moving to the southeast and southwest within the Central Region.

Group H

Parcels in Group H are located within basin 154 (Newark Valley) and 155A (Little Smoky Valley, Northern Part). Basin fill aquifer sediments are the most common hydrogeologic material in the group H area, with mapped exposures of the upper siliciclastic confining unit north and south, and the lower carbonate aquifer unit to the west of the area. Regional groundwater flow is generally north to south throughout the Central Region, with some westerly and southeasterly

flow components (Harrill and Prudic, 1998).

Surface Water

Surface water resources in the eastern Great Basin include perennial, intermittent, and ephemeral streams, marshlands and small lakes, intermittently inundated playas, springs, and manmade impoundments. The Ely RMP/FEIS describes surface water conditions in some detail. Soil salinity management, tamarisk control, and soil erosion is also discussed. Most streams in the analysis area are ephemeral and flow from the mountains to seep into unconsolidated deposits or are diverted for irrigation. Map 3.3-1 in the RMP/FEIS shows the approximate location of perennial streams and mapped springs within the overall boundary of the analysis area. The classification of waters in White Pine, northeastern Nye, and Lincoln counties (Nevada Administrative Code 445A.124 to 445A.127) are presented in Table 3.3-2 of the RMP/FEIS. This table shows that many reservoirs are Class B or Class C waters, while most streams in the analysis area are Class A waters. See the RMP/FEIS for definitions.

Group A

Most of the parcels are located within watersheds that drain into the Virgin River. Surface water resources within these watersheds are comprised of mostly intermittent and ephemeral streams, flowing only after large storm events, and small spring systems. The Federal Emergency Management Agency (FEMA) has classified the land area of these parcels as Zone X (see Floodplains section below for classification descriptions).

Groups B, C, and E

All of the parcels within this group, with the exception of the group B parcel subgroup located in hydrographic area 170, are located within watersheds that flow into the White River. The watersheds around the group B parcel subgroup are within watersheds that drain internally within Penoyer Valley. Surface water resources within these watersheds are comprised of mostly intermittent and ephemeral streams, flowing only after large storm events, a few perennial reaches along the White River and headwater streams and several spring systems. Many of the spring systems are perennial with some discharging 100+ gallons per minute of which 13 are considered to be major discharge areas for the valley. Spring discharge contributes flow to localized perennial reaches of the White River and to several surface-water features (e.g., ponds, reservoirs, marshes, wetlands) in the basin, including extensive surface-water features in the Kirch Wildlife Management Area in the southern portion of the basin (BLM 2012). FEMA has classified the land area of the group B parcels as Zone X, most of group C as Zone X with the remainder of group C and all of group E as unclassified.

Group D

The group D parcels are located in watersheds that drain internally within Railroad Valley, Northern Part. There are three large springs within Railroad Valley, Northern Part that combined discharge approximately 22 cubic feet per second (Van Denburgh and Rush, 1974). Duckwater Creek is fed by Duckwater Spring, which flows perennially through private property that is surrounded by the northern parcels of group D. FEMA has classified the land area of these parcels as Zone X.

Group F

The parcels of group F have no perennially flowing streams, with most surface water features being ephemeral systems that flow water during storm events. Group F parcels located in basin

184 are in watersheds that drain westward into the Central Region, and those parcels located in basin 195 are in watersheds that drain eastward into the Great Salt Lake Basin. No mapping data is yet available for the land area containing the parcels of group F.

Group G

Surface waters within the group G parcels are comprised of mostly intermittent and ephemeral streams, flowing only after large storm events. Gleason Springs lie northeast of the group G parcels with a short associated section of perennial flow. The parcels lie within watersheds that drain into Gleason Creek. No mapping data is yet available for the land area containing the parcels of group G.

Group H

The parcels of group H contain a few streams that flow perennially from the west flank of the Diamond range. Other surface water in the group H area consist of intermittent and ephemeral streams and flowing springs. The water table is quite shallow in the adjacent Newark Valley floor, and frequently produces standing surface water in the valley bottom. No mapping data is yet available for the land area containing the parcels of group H.

Riparian/Wetland Zones

Riparian wetland sites in the project area are mostly lentic, which refers to standing water as in lakes, springs, and bogs, or lotic, where water is flowing as in rivers and streams (BLM 2007). Water quality and supply is intimately related to the health of riparian and wetland ecosystems.

Riparian and wetland areas represent a small percentage of the land in and around the lease parcel areas, but contain the majority of biodiversity and are vital ecologic functions. Research has shown that riparian and wetland habitat characteristically has a greater diversity of plant and animal species than adjoining areas. Approximately 16.5 miles of perennial stream flows along private land in the lease parcels, and approximately 6 miles flow through the parcels on public land. These streams may have associated riparian habitat.

Most of the riparian wetland sites within the project area are associated with lentic environments. The size of these systems can vary greatly from very small to very large which can be dependent of the discharge rates of the lentic source. Springs that occur in high-elevation areas in the mountains are generally controlled by discharge from localized or perched groundwater systems that are not hydraulically connected to the regional groundwater system (Prudic et al. 1995).Many small springs also occur in the valleys or along the margins of the valleys. The occurrence and discharge of these springs generally is controlled by flow along intermediate flow paths that originate in the adjacent mountain ranges or alluvial fans (BLM 2012).

Large springs (greater than 100 gpm) with relatively constant discharge rates are present in several valleys within the hydrologic study area. These springs typically discharge from carbonate rock or from basin-fill that overlies or that is adjacent to carbonate rocks (Prudic et al. 1995). Discharge at these large springs is presumed to be controlled by groundwater that moves through a deep, regional groundwater flow system. Because these springs are controlled by the regional groundwater system, the springs are generally warmer in temperature and have a distinct chemical signature.

Floodplains

Federal Emergency Management Agency (FEMA)-designated Zone A flood hazard areas, which would be flooded during a 100-year, 24-hour runoff event Areas identified within Zone A or AE flood hazard areas would be subject to Federal Regulation and mitigation; however FEMA flood mapping data are not yet available for parts of White Pine County, NV. Areas identified as Zone X, which are moderate risk areas within the zone of 0.2 percent annual chance of flood hazard, but where no base flood evaluations or depths are shown. Parcel group D, and most of group C are in Zone X areas. The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. Flood insurance is optional and available and the flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk. Groups A and B are in Zone D areas. Mapping data are not yet available for groups E, F, G and H in White Pine County.

Oil and gas lease stipulation #NV-L-10-C-NSO in Appendix A.2 of the Ely RMP/FEIS, as amended in 2015, prohibits any surface occupancy for oil and gas on 100-year flood plains of major rivers that have a one percent chance of flooding in any given year.

Municipal Wellhead Zones and Drinking Water Protection Areas

No lease areas are located within a Municipal Wellhead Zone or Drinking Water Protection Area.

Lessees should be aware of Lease Notice NV-L-10-E-NTL, which may require further analysis if Municipal Well Head Zones or Drinking Water Protection Areas change in the future.

Environmental Effects

Proposed Action

The sale of parcels and issuance of oil and gas leases is strictly an administrative action. The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to water quality and surface water. Nominated lease parcels were reviewed against the Ely RMP, and stipulations are attached to mitigate any known environmental or resource conflicts that may occur on a given lease parcel. Potential on-the-ground impacts would not occur until a lessee applies for and receives approval of their APD on the lease. Water for any development activity would either come from private sources or would have to be permitted by the State of Nevada since water rights are exclusively managed by the Nevada State Engineer. However, impacts from use of water for a project would be analyzed future NEPA analysis.

The BLM cannot determine at the leasing stage whether or not a proposed parcel would actually be sold, or if it is sold and issued, whether or not the lease would be explored and developed. Consequently, the BLM cannot determine exactly where a well or wells may be drilled or what technologies that may be used to drill and produce wells, so the impacts listed below are general, rather than site-specific.

Additional NEPA analysis would be conducted prior to approval of an APD and would provide site-specific analysis for the well location, exploration and development activities. Appropriate stipulations in compliance with the Ely RMP and specifically Objective WR-2 would be applied to leases to address determined vulnerability.

Surface Water:

Subsequent development of a lease may result in long-and short term alterations to the hydrologic regime depending upon the intensity of development. Clearing, grading, and soil stockpiling activities associated with exploration and development actions could alter short term overland flow and natural groundwater recharge patterns resulting in *de minimis* risk. In risk assessment, it refers to a level of risk that is too small to be concerned with.

Runoff associated with storm events could increase sediment/salt loads in surface waters down gradient of the disturbed areas. Sediment may be deposited and stored in minor drainages where it could be readily moved downstream during heavy storms. Sediment from future development activity may be carried into contained basins and sloughs where water quality classifications could be exceeded. The land-locked nature of most lease parcels and distance of other parcels to potentially impacted surface waters would restrict effect on the amount of sediment and salt contributed by lease exploration and development activities. Surface erosion may be greatest during the construction phases and would be controlled through integrated measures, BMPs, and appropriate mitigation measures.

The magnitude of the impacts to surface water resources from future development activities depends on the proximity of disturbances to drainage channels, slope aspect and gradient, degree and area of soil disturbance, soil character, duration of construction activities, and the timely implementation and success/failure of mitigation measures. Natural factors which attenuate the transport of sediment and salts into susceptible water bodies include water available for overland flow; the texture of the eroded material; the amount and kind of ground cover; the slope shape, gradient, and length; and surface roughness. Impacts could likely be greatest shortly after the start of construction activities and would likely decrease in time due to stabilization, reclamation, and revegetation efforts. Potential minor long-term impacts to the watershed and hydrology could continue for the life of surface disturbance from water discharge from roads, road ditches, and well pads, but would decrease once all well pads and road surfacing material has been removed and reclamation of well pads, access roads, pipelines, and power lines has taken place. Potential short-term impacts to the watershed and hydrology from access roads that are not surfaced with impervious materials may occur and would likely decrease in time due to reclamation efforts. Limiting factors include the small area affected and implementation of integrated measures, BMPs, and appropriate mitigation measures.

Although there is a low potential for oil and gas development to contribute sediment loads to aquatic systems, there is no reasonable likelihood that siting adjustments, State and federally-imposed sedimentation and storm-control measures, and reclamation strategies would fail to provide adequate means to effectively prevent substantive off-site transport and delivery of sediments or fluids that may impair downstream riparian or aquatic conditions in the closed basins. Moreover, deferral within the most sensitive areas (i.e. Big, Warm, and Hot Springs, and the Kirch WMA) would further mitigate impacts.

Groundwater:

Hydraulic fracturing is designed to change the producing formations' physical properties by increasing the flow of water and gas around the well bore. Well stimulation may also introduce chemical additives into the producing formations. This change in physical properties may open up new fractures or enhance existing fractures that could result in freshwater aquifers being contaminated with natural gas, condensate and/or chemicals used in drilling, completion and hydraulic fracturing. Impacts to groundwater resources could occur due to failure of well

integrity, failed cement, surface spills, and/or the loss of drilling, completion and hydraulic fracturing fluids into groundwater. Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. Concentrations of these additives also vary considerably and are not always known since different mixtures can be used for different purposes in gas development and even in the same well bore. Known production zones in Nevada are generally below 3,000 feet and do not contain freshwater, however, the regional carbonate system is known to be deeper in certain areas. Potential impacts and proximity between production zones and freshwater aquifers would need to be analyzed in the APD stage.

Loss of drilling fluids may occur during the drilling process due to changes in porosity or other properties of the rock being drilled through. When this occurs, drilling fluids may be introduced into the surrounding formations which could include freshwater aquifers, if it occurs when drilling the surface casing. Some or all of the produced water from these leases is likely to be injected in wells for disposal. Petroleum products and other chemicals could result in groundwater contamination through sources such as pipeline and well casing failure, well (gas and water) construction, and spills. Similarly, improper construction and management of reserve and evaporation pits could degrade ground water quality through leakage and leaching. The potential for negative impacts to groundwater caused from hydraulic fracturing, are currently being investigated by the EPA. Authorization of the proposed projects would require compliance with local, state, and federal directives, regulations, permitting, and stipulations that relate to surface and groundwater protection, as well as federal and State of Nevada guidelines for hydraulic fracturing.

If contamination of freshwater aquifers from oil and gas development occurs, changes in groundwater quality could impact springs and residential wells if these springs and residential wells are sourced from the same aquifers that have been affected. Potential impacts to surface water would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Impacts to groundwater would be less evident and occur on a longer time scale. Construction activities would occur over a relatively short period (commonly less than a month); however, natural stabilization of the soil can sometimes takes years to establish to the degree that would adequately prevent accelerated erosion caused by compaction and removal of vegetation. Spills or produced fluids (e.g., saltwater, oil, hydrofracturing chemicals, and/or condensate in the event of a breech, overflow, or spill from storage tanks) could result in contamination of the soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term (BLM 2013).

Specific concerns for indirect impacts from subsurface activity are outlined below:

- Water consumption / drawdown – Impacts would be avoided with additional project-specific analysis and application of minimization measures, including but not limited to obtaining water offsite, or tanked water supplies. Therefore, impacts from water consumption are not likely.
- Disposal of drilling or fracking fluids – Impacts would be avoided with additional project-specific analysis and application of minimization measures, including but are not limited to hauling waste material for proper disposal. Therefore, impacts from disposal of fluids are not likely.
- Drilling through carbonate aquifer – Impacts would be minimized through incorporation of

BLM and State of Nevada regulations and policies. Currently in Nevada, state regulations are stronger and operations are held to a stricter standard than federal regulations. State regulations require casing and cementing to isolate wells and production zones from communication with formations being drilled through. Impacts from drilling through aquifers are anticipated to be remote.

- Hydraulic Fracturing – There have been a total of 4 wells fracked in Nevada, all in compliance with state and federal regulations. None of those wells experienced issues with casings or cement, which would lead to contamination. Impacts from hydraulic fracturing are anticipated to be remote.

Not all wells resulting from APDs would employ fracturing and water consumption would be temporary. Oil and gas wells are cased and cemented at a depth below all usable water zones; consequently impacts to water quality at springs and residential wells are not expected. Additional specific COAs would be utilized to reduce the risks to groundwater. These mitigations would be identified at the APD stage.

Riparian/Wetland Zones

Impacts to riparian areas from development of the parcels could be direct due to increased surface runoff from a site. This could cause increased sedimentation or even contamination of an area if there are contaminants in the runoff. Indirect impacts to riparian areas would be related to potential groundwater pumping and contamination of aquifer sources. Site specific analysis should be completed prior to any exploration or drilling and lessees' should follow all State and BLM requirements for well development and monitoring to reduce potential for impacts.

Floodplains

Federal Emergency Management Agency designated Zone A flood hazard areas, which would be flooded during a 100-year, 24-hour runoff event. Site-specific analysis for any parcels located in Zone A or AE and in unmapped areas, to identify potential flood plain impacts, would be required prior to drilling in parcels that meet this designation. The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. Flood insurance is optional and available and the flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk.

Municipal Wellhead Zones and Drinking Water Protection Areas

No lease areas are located within a Municipal Wellhead Zone or Drinking Water Protection Area.

Depending on future development within municipalities and changes in groundwater availability, these areas may change in the future. Site-specific analysis, to identify potential impacts, would be required prior to drilling in parcels that meet this designation.

No Action Alternative

There would be no direct, indirect or cumulative impacts to surface or groundwater under the No Action Alternative.

3.3.3. Fish and Wildlife

Affected Environment

The analysis area includes six groups of parcels across the Ely District. These parcels are expected to provide habitat for a large number of wildlife species. Several species of mammals, birds, reptiles, amphibians, fish, and invertebrates may inhabit any of the proposed lease areas.

A number of parcels proposed for leasing are located in areas of special importance to one or more wildlife species, such as crucial winter range for mule deer. These areas may include special stipulations from the Ely RMP concerning drilling activities, which would have to be followed by proponents proposing to develop specific sites.

- Group B, C, D, F, and H parcels contain raptor nests that were active in at least the last 5 years. A raptor nest timing limitation would be applied to these parcels and all future nests, if located.
- Group A, F and G (-001, -008, -009, -010, -011, and, -013 -292) parcels contain approximately 5,600 acres of crucial winter habitat for mule deer. A timing limitation would be applied in crucial winter habitat.
- Parcels in Group C overlap Kirch Wildlife Management Area and Parcels in Group B are adjacent to Key-Pittman Wildlife Management Area. Both management areas provide habitat for several aquatic and riparian species.
- Group H parcels (-001, -007, -008, -010, -011, -014, -020, -021, -022, -024) contain approximately 6,200 acres of crucial winter habitat for pronghorn antelope. A timing stipulation would be applied in crucial winter habitat.

Environmental Effects

Proposed Action

There would be no direct effects from issuing new oil and gas leases because leasing does not directly authorize oil and gas exploration and development activities. Direct impacts from these activities would be analyzed under a separate site-specific NEPA analysis. The RFFD scenario is the basis for indirect future or potential impacts that could occur once the parcels are leased.

Impacts to general wildlife species are anticipated to occur at the local level during the exploration and development phase. Under the RFFD scenario, 7,742 acres are anticipated to be disturbed, with the disturbance most likely dispersed throughout the nominated 388,960 acres. Given the level of disturbance would be less than 1% of the total nominated acres, short-term and long-term impacts to overall habitat and species populations are anticipated to be negligible. During the exploration and development phase, direct impacts to individuals include but are not limited to displacement, reduction of habitat quality, injury, or mortality. These impacts are not anticipated to negatively affect species populations and would be minimized with mitigation measures that, if warranted, would be applied during additional analysis. Protection of Crucial Winter habitat is important in protecting habitat that supports critical life stages for game species populations. Table 3.5 indicates the anticipated disturbance to crucial winter habitat for mule deer and pronghorn antelope, under the assumption that disturbance would be spatially equal across all nominated acres. Mitigation measures and timing stipulations would be applied during additional analysis.

Table 3.5 Anticipated Acres of Disturbance in Crucial Winter Habitat

Species	Nominated acres	RFFD Disturbance	Crucial Winter Habitat within nominated parcels	Anticipated disturbed Crucial Winter Habitat	
				Short term	Long Term
Mule Deer	389,000	7742 acres	5,600 Acres	5 Acres 0.08%	1 acre 0.01%
Pronghorn	389,000	7742 acres	6,200 acres	5 acres 0.08%	1 acre 0.01%

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and impacts to fish and wildlife would not occur.

3.3.4. USFWS Listed (or proposed for listing) Threatened or Endangered Species or critical habitat

Affected Environment

Species listed as proposed, threatened, or endangered under the Endangered Species Act (ESA) that occur within and/or near the lease parcels are indicated in Table 3.6 and described below.

Table 3.6 Species Occurring In or Near Nominated Parcels and Associated Hydrobasins

Species	Federal Listed Status	Acres in Nominated Parcels		Hydrobasins with habitat	Parcel Groups in occupied hydrobasins
		Critical	General		
Desert Tortoise (*Gopherus agassizii*)	Threatened	3,604	13,453	Virgin River Valley, Pahranagat Valley	A and B
White River Spinedace (*Lepidomeda albivallis*)	Endangered	0	0	White River Valley	B and C
Railroad Valley Springfish (*Crenichthys nevadae*)	Threatened	0	0	Railroad Valley	D
Virgin River Chub (*Gila seminuda*)	Endangered	0	0	Virgin Valley River	A
Woundfin (*Plagopterus argentissimus)*	Endangered	0	0	Virgin Valley River	A

Southwestern willow flycatcher (*Empidonax traillii extimus*)	Endangered	0	0	Pahranagat Valley, Virgin River Valley	A and B
Yuma clapper rail (*Rallus longirostris yumanensis*)	Endangered	0	0	Pahranagat Valley, Virgin River Valley	A and B
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	0	0	Pahranagat Valley, Virgin River Valley	A and B

Environmental Effects

Proposed Action

Desert tortoise:

Geophysical exploration could impact individual desert tortoises. Tortoises of the *Gopherus* genus in North America have a highly evolved otolithic ear, which could be used to detect seismic vibrations (Bramble and Hutchison 2014). Exact impacts are unknown, but tortoises underground in their burrows could be highly sensitive to geophysical exploration if seismic vibrations are sent through an area with desert tortoises. Exploration and development for oil and gas would likely disturb or destroy critical habitat in the Beaver Dam Slope Critical Habitat Unit

Hydrobasins of Concern for federally listed species:

There are no anticipated direct impacts for parcels in hydrobasins of concern that do not overlap with occupied habitat or designated critical habitat for federally listed species. Nominated parcels are at a distance where surface disturbing activities are not likely to have an effect.

As discussed in Section 3.3.2 for groundwater the likelihood of impacts to groundwater are anticipated to be remote. With minimization measures, additional analysis, and section 7 consultation, there are no anticipated indirect impacts from oil and gas exploration. However, some species like the White River Spinedace (*Lepidomeda albivallis*) and the Railroad Valley Springfish (*Crenichthys nevadae*) are endemic to these hydrobasins. If a failure were to occur, the effects could be catastrophic for habitat and the species in aquatic and riparian environments within these connected hydrobasins.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and no impacts to T&E species would occur as a result of leasing the nominated parcels.

3.3.5. Special Status Animal Species, other than those listed or proposed by the USFWS as Threatened or Endangered

Affected Environment

BLM Manual 6840 entitled Special Status Species Management states BLM special status species are those that 1) are listed or proposed for listing as endangered or threatened under the

Endangered Species Act (ESA), and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau Sensitive by the State Director(s). Additionally, all federal candidate species, proposed species and delisted species in the five years following delisting would be conserved as Bureau sensitive species. Table 3.5 indicates which groups contain or are immediately adjacent to habitat for BLM Special Status Species, other than those listed or proposed to be listed by the USFWS. The Special Status Species list is currently under review by the Nevada State Office and is subject to change.

Table 3.7 BLM Special Status Species by Parcel Group

Common Name	Scientific Name	Parcel Group							
		A	B	C	D	E	F	G	H
Reptiles									
Gila monster	*Heloderma suspectum cinctum*	X	X						
Sonoran mountain kingsnake	*Lampropeltis pyromelana*					X	X		
Fish									
Hiko White River springfish	*Crenichthys baileyi grandis*		X						
Pahranagat roundtail chub	*Gila robusta jordani*		X						
Pahranagat speckled dace	*Rhinichthys osculus velifer*		X						
Railroad Valley springfish	*Crenichthys nevadae*				X				
Railroad Valley tui chub	*Gila bicolor ssp. 7*				X				
White River speckled dace	*Rhinichthys osculus ssp. 7*			X		X			
White River spinedace	*Lepidomeda albivalis*			X		X			
Birds									
Golden eagle	*Aquila chrysaetos*	X	X	X	X	X	X	X	X
Northern goshawk	*Accipter gentilis*			X		X		X	
Western burrowing owl	*Athene cunicularia hypugaea*	X		X		X			X
Ferruginous hawk	*Buteo regalis*		X	X	X	X	X	X	X
Swainson's hawk	*Buteo swainsoni*		X	X	X	X			
Greater sage-grouse[1]	*Centrocercus urophasianus*			X	X	X	X	X	X

Western snowy plover[2]	*Charadrius nivosus nivosus*		X	X	X				
Peregrine falcon	*Falco peregrinus*			X					X
Bald eagle	*Haliaeetus leucocephalus*		X	X	X	X	X	X	X
Loggerhead shrike	*Lanius ludovicianus*		X	X					X
Mammals									
Pallid bat	*Antrozous pallidus*		X	X			X		
Big brown bat	*Eptesicus fuscus*			X					
Silver-haired bat	*Lasionycteris noctivagans*			X					
Western red bat	*Lasiurus blossevillii*		X						
California myotis	*Myotis californicus*		X						
Western small-footed myotis	*Myotis ciliolabrum*			X			X		X
Long-eared myotis	*Myotis evotis*			X			X		
Little brown myotis	*Myotis lucifugus*		X						
Fringed myotis	*Myotis thysanodes*		X						
Yuma myotis	*Myotis yumanensis*		X	X					
Brazilian free-tailed bat	*Tadarida brasiliensis*		X				X		
Dark kangaroo mouse	*Microdipodops megacephalus*		X	X					
Pale kangaroo mouse	*Microdipodops pallidus*		X						
Pahranagat Valley montane vole	*Microtus montanus focosus*		X	X					
Pygmy rabbit	*Brachylagus idahoensis*			X		X	X	X	X
Bighorn sheep[1]	*Ovis canadensis*	X	X	X	X		X		

[1]Stipulations may apply to parcels containing habitat for this species.

[2]Individuals that occur within the Ely District are not protected under the Endangered Species Act. Protection is limited to within 50 miles of the Pacific coastline.

Environmental Effects

Proposed Action

Impacts would be similar to those described under the Fish and Wildlife section of this document such as habitat loss and/or degradation or displacement from noise and human presence. Because of the highly specialized and endemic nature of some special status animal species, additional mitigation measures may be needed at the exploration and development stages.

Notices and timing stipulations would minimize some effects to special status animal species. For example, the raptor nest site timing stipulation would minimize effects to Northern goshawk, golden eagle, Western burrowing owl, ferruginous hawk, and peregrine falcon during the breeding season.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and no impacts to Special Status Animal Species would occur.

3.3.6. Special Status Plant Species, other than those listed or proposed by the USFWS as Threatened or Endangered

Affected Environment

BLM Manual 6840 entitled Special Status Species Management states BLM special status species are those that 1) are listed or proposed for listed as endangered or threatened under the Endangered Species Act (ESA), and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau Sensitive by the State Director(s). Additionally, all federal candidate species, proposed species and delisted species in the five years following delisting would be conserved as Bureau sensitive species. See Appendix H for a complete list of all Special Status Species that have the potential to be affected directly or indirectly by oil and gas leasing. The following section includes special status species as well as species that may not appear on the BLM Nevada Special Status Species list but are otherwise rare, limited in distribution, or tracked by the Nevada Natural Heritage Program.

- BLM sensitive plant species, including Sunnyside green gentian (*Frasera gypsicola)*, Eastwood milkweed (*Asclepias eastwoodiana*), Blaine pincushion (*Sclerocactus blainei*), Railroad Valley globe mallow (*Sphaeralcea caespitosa* var. *williamsiae*), currant milkvetch (*Astragalus uncialis*), Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii)*, rock purpusia (*Ivesia arizonica* var. *saxosa)*, intermountain wavewing (*Cymopterus bsalticus)*, and Great Basin fishhook cactus (*Sclerocactus pubispinus)* may occur in the vicinity of parcels in Groups A, B, C, D, and F.
- Three parcels in Group C overlap the White River Valley Area of Critical Environmental Concern (ACEC). According to Appendix A-2 of the Ely District Record of Decision and Approved RMP (page A.2-10) the White River Valley ACEC is designated “no surface occupancy.” The White River Valley ACEC was designated for protection of numerous sensitive plant and animal species and unique badland soil types. According to Appendix D of the Ely Proposed RMP/Final EIS: “The predominant plant community in which most of these plant populations occur is pygmy sagebrush (*Artemisia pygmaea*) dwarf shrub lands

which are restricted to the Great Basin and adjacent ecoregions. Pygmy sagebrush dwarf shrub lands are plant communities considered rare and local throughout its range by NatureServe."

Environmental Effects

Proposed Action

There would be no direct effects from issuing new oil and gas leases because leasing does not directly authorize oil and gas exploration and development activities. Direct impacts from these activities would be analyzed under a separate site-specific NEPA analysis. The RFFD scenario is the basis for indirect future or potential impacts that could occur once the parcels are leased. Oil and gas exploration, and production activities, as outlined in the RFFD scenario, have the potential to affect vegetation as follows:

- Reduction or loss in production, distribution, and vigor of sensitive plant communities due to oil and gas activities.
- Ground disturbance and activities associated with oil and gas have the potential to introduce invasive plant species to communities that currently lack invasive plants (Blumenthal 2005). An increase in non-native plants such as cheatgrass can also lead to increased risk of wildfire. Mitigation measures, such as reclamation and cleaning of vehicles prior to site entry would reduce the risk of introduction of invasive plant species.
- Recovery of native plant communities following reclamation could vary depending on habitat type. Appendix D of the Ely Proposed RMP/Final EIS identified threats to the White River Valley ACEC "…include any action which disrupts soil surfaces and vegetation cover such as off-highway vehicle use and road maintenance or construction. The introduction of invasive and nonnative plants to the area, oil and gas exploration … constitute a threat to the protected resources." As noted in the RMP, oil and gas exploration poses a threat to the White River Valley ACEC. Parcels within the ACEC are subject to a "No Surface Occupancy" stipulation, which would reduce this threat. Special status plant species populations that are not encompassed by the ACEC could be impacted by this alternative.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and no impacts to Special Status Plant Species would occur.

3.3.7. Cultural Resources

Cultural resources include, but are not limited to rock art, Paleo-Indian and other prehistoric habitation sites, utilized rock shelters and caves, historic cemeteries, mines, town sites and dwellings. The primary impact mechanisms that could affect cultural resources within the District include off-highway vehicle and recreational use, minerals development, land disposal, fire, special designations, and livestock grazing. Some of these mechanisms would have a negative impact on cultural resources, which would be mitigated through avoidance, project abandonment or redesign, and, if necessary, data recovery. However, some of these mechanisms may have a positive or beneficial impact on cultural resources, such as protection under an ACEC designation.

Affected Environment

Any program, activity, or project has an effect on a cultural resource if it alters any of the characteristics or criteria that may qualify the resource for inclusion on the National Register of Historic Places (NRHP) or otherwise affects a cultural property's legally protected status. Impacts to cultural properties are considered adverse if the effect diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Negative or adverse effects can include, but are not limited to: physical destruction of, or damage to, all or part of a property; alteration of a property (e.g., restoration, rehabilitation, stabilization); removal of a property from its historic location; or, transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation (Ely RMP).

The cultural landscape on the Ely District provides evidence of a long history of human occupation. The earliest commonly accepted time frame for prehistoric human presence in the Nevada is approximately 10,000 to 11,000 years before present. The region has been consistently, though not densely, populated up to the present day. The prehistoric and historic cultural landscape encompasses artifacts, features, sites, and districts. These evidence classes relate to prehistoric subsistence, lifeways, cultural affiliation, and historic settlement of Nevada that includes mining, ranching, and agriculture.

Environmental Effects

The lease of oil and gas parcels does not entail ground disturbing activities as part of the undertaking. Therefore, this undertaking would not result in impacts to cultural resources. All ground disturbing actions associated with the development of a lease after it has been sold require additional NEPA and NHPA section 106 compliant Class III survey analysis. Lease Notices and Stipulations are found in Appendix C. Notices are included with all parcels and Stipulations are also included with parcels that have known NRHP eligible cultural resource sites. As required by law, prior to any development, cultural resources will be evaluated in future NEPA analysis and adverse effects will be mitigated prior to ground disturbance for those resources eligible for listing on the NRHP.

Proposed Action

A Cultural Resources Inventory Needs Assessment (8111 NANV040FY17-041) was conducted to ensure that previously recorded cultural sites with significance or importance in accordance with NRHP criteria were identified within the nominated parcels. Cultural Resource data was reviewed from the Nevada Cultural Resource Information System, BLM cultural resource files in the Caliente Field Office, and other sources. No parcels contain sites listed on National Register of Historic Places (NRHP). However, numerous recommended eligible and unevaluated sites are known to be within about half the parcels. Most Lease Sale parcels have not been thoroughly ground surveyed. Those parcels that have been surveyed will require an updated survey. It should be expected that undocumented additional NRHP eligible sites will be discovered when the surveys are completed. All Lease Sale parcels will come with a Notice of possible National NRHP eligible sites present and mandate an individual EA, including NHPA Section 106 compliant Class III survey analysis, before any ground disturbance.

No Action Alternative

The No Action Alternative would not impact cultural resources in the area.

3.3.8. Heritage Special Designations (National Monuments, Historic Trails, ACECs designated for Cultural Resources, Archaeological Districts and Areas)

Heritage Special Designated areas have special interest or importance to the Nevada State Historic Preservation Office (SHPO), Native American Tribes, and the general public. Heritage Special Designated areas take the form of National Monuments, National Register of Historic Places (NRHP) designated sites or districts, National Historic Trails, and Areas of Critical Environmental Concern (ACEC) for cultural resources. The primary impact mechanisms that could affect Heritage Special Designated areas within the District include off-highway vehicle and recreational use, minerals development, land disposal, fire, special designations, and livestock grazing. Some of these mechanisms would have a negative impact on Heritage Special Designated areas, which would be mitigated through avoidance, project abandonment or redesign, and, if necessary, data recovery. The National Scenic and Historic Trails (NSHT) are formally designated through Congressional and Presidential process in conjunction with the National Landscape Conservation System (NLCS). Protection under an ACEC designation has a positive and beneficial impact on Heritage Special Designated areas giving them special management consideration.

Affected Environment

Any program, activity, or project has an effect on a Heritage Special Designated areas if it alters any of the characteristics or criteria that may qualify the resource for inclusion on the NRHP or otherwise affects a cultural property's legally protected status.

Impacts to Heritage Special Designated areas are considered adverse if the effect diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Negative or adverse effects can include, but are not limited to: physical destruction of or damage to all or part of a property; alteration of a property (e.g., restoration, rehabilitation, stabilization); removal of a property from its historic location; or, transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation (Ely RMP).

The Cultural Resources Inventory Needs Assessment (8111 NANV040FY17-041) prompted a literature review to ensure that Heritage Special Designated areas were identified within the nominated parcels. Cultural Resource data was reviewed from the Nevada Cultural Resource Information System and BLM Nevada State cultural resource files in the Caliente Field Office, and other sources. Based on the results of the initial search, there are no Heritage Special Designated areas of direct concern in the nominated parcels. However, the east-central parcels in Parcel Group H are in visual range of the Sunshine Locality.

Several Historic Trails are of concern for some parcels. The Lincoln Highway runs through Group G and southern parcels in Group H. The Pony Express NSHT does not cross, but is within visual range of several Group H parcels. The southern parcels of Group F may be in visual range of the Osceola Ditch.

None of the proposed lease parcels are located within the Basin and Range National Monument.

Environmental Effects

The lease of oil and gas parcels does not entail ground disturbing activities as part of the undertaking. Therefore, this undertaking would not result in impacts to Heritage Special Designated areas.

Proposed Action

The Lincoln Highway runs through parcels NV-17-12-001, 002, 003, 011, 012, & 205. The Sunshine Locality and several Historic Trails are within a range of 1 to 15 miles and may be indirectly visually impacted by development if it were to occur. All other Parcels are greater than the RMP consideration of 1 mile distant viewshed from the Heritage Special Designated areas.

No Action Alternative

The No Action Alternative would not impact Heritage Special Designated areas.

3.3.9. Visual Resources Management

The proposed parcels nominated for lease fall within Visual Resource Management (VRM) Classes designated in the Ely RMP (BLM 2008). BLM administered lands are placed into four visual resource inventory classes: VRM Classes I, II, III, IV. Class I and II are the most sensitive, Class III represents a moderate sensitivity and Class IV is of the least sensitivity (see table below). VRM classes serve as a management tool that provides an objective for managing visual resources.

Table 3.8 VRM Classification Objectives

VRM Classes	Visual Resource Objective	Change Allowed (relative Level)	Relationship to the Casual Observer
Class I	Preserve the existing character of the landscape. Provide for natural ecological changes; however it does not preclude very limited management activity.	Very low	Activities must not attract attention.
Class II	Retain the existing character of the landscape. The level of change to the characteristic landscape should be low.	Low	Activities may be seen, but should not dominate the view
Class III	Partially retain the existing character of landscape. The level of change to the characteristic landscape should be moderate.	Moderate	Activities may attract attention, but should not dominate the view.
Class IV	Provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.	High	Activities may attract attention, may dominate the view.

Affected Environment

Group A parcels are located within VRM III and IV. These parcels are located in the remote southeastern edge of the Ely District, the Clover Mountain Wilderness is to the north, and the Mormon Mountains Wilderness is located to the west.

Group B parcels are located primarily within VRM III with a few parcels located within VRM II. These parcels are located east of the Mount Irish and Weepah Spring Wilderness, to the north and west of South Pahroc Wilderness and the west of the Big Rocks Wilderness. The parcels are located north of Highway 93 above the town of Alamo.

Group C parcels are located primarily within VRM III. These parcels are located east of the South Egan Range Wilderness and the Far South Egans Wilderness. The majority of these parcels are located west of Highway 318 near Wayne E. Kirch Wildlife Management Area with a few parcels on the east side of Highway 318 near Sunnyside.

Group D parcels are located primarily within VRM III with fewer parcels located within VRM IV. The majority of these parcels are located to the west of Highway 6 with a fewer parcels to the east. In addition, there are a few parcels adjacent to the Humboldt National Forest.

Group E parcels are located within VRM II, III, and IV. The parcels are located north of Lund and east of Highway 318 and east of Highway 6. The South Egan Range Wilderness is located to the east of the lower parcels and a few parcels are adjacent to the Humboldt National Forest.

Group F parcels are located within VRM II and III. The parcels are located east of Ely in the Sacramento Pass area Highway 6/50. The Great Basin National Park is to the south and a few parcels are adjacent to the Humboldt National Forest.

Group G parcels are located primarily within VRM III with fewer parcels within VRM IV. These parcels are located northwest of Ely and west of MiGill within Highway 50 Robinson Summit. The Bristlecone Wilderness is to the northeast.

Group H parcels are located within VRM III. These parcels are located on the Ely District and Battle Mountain District boarder near Eureka. The Humboldt National Forest is located to the south east of the south sections of the parcels.

Environmental Effects

The actual sale of the lease parcels would not impact visual resources, though the development of the leased parcels may impact visual resources. When an APD is submitted, a site-specific visual contrast rating would be conducted. The contrast rating would identify what types of mitigation are needed to minimize any visual contrast. Those recommended mitigation measures would be incorporated into the APD as a means to meet the VRM class objective.

Proposed Action

Group A, C, D, and G are all VRM III and IV. Objectives for VRM III and IV would be met during development by incorporating design features or requiring mitigation measures.

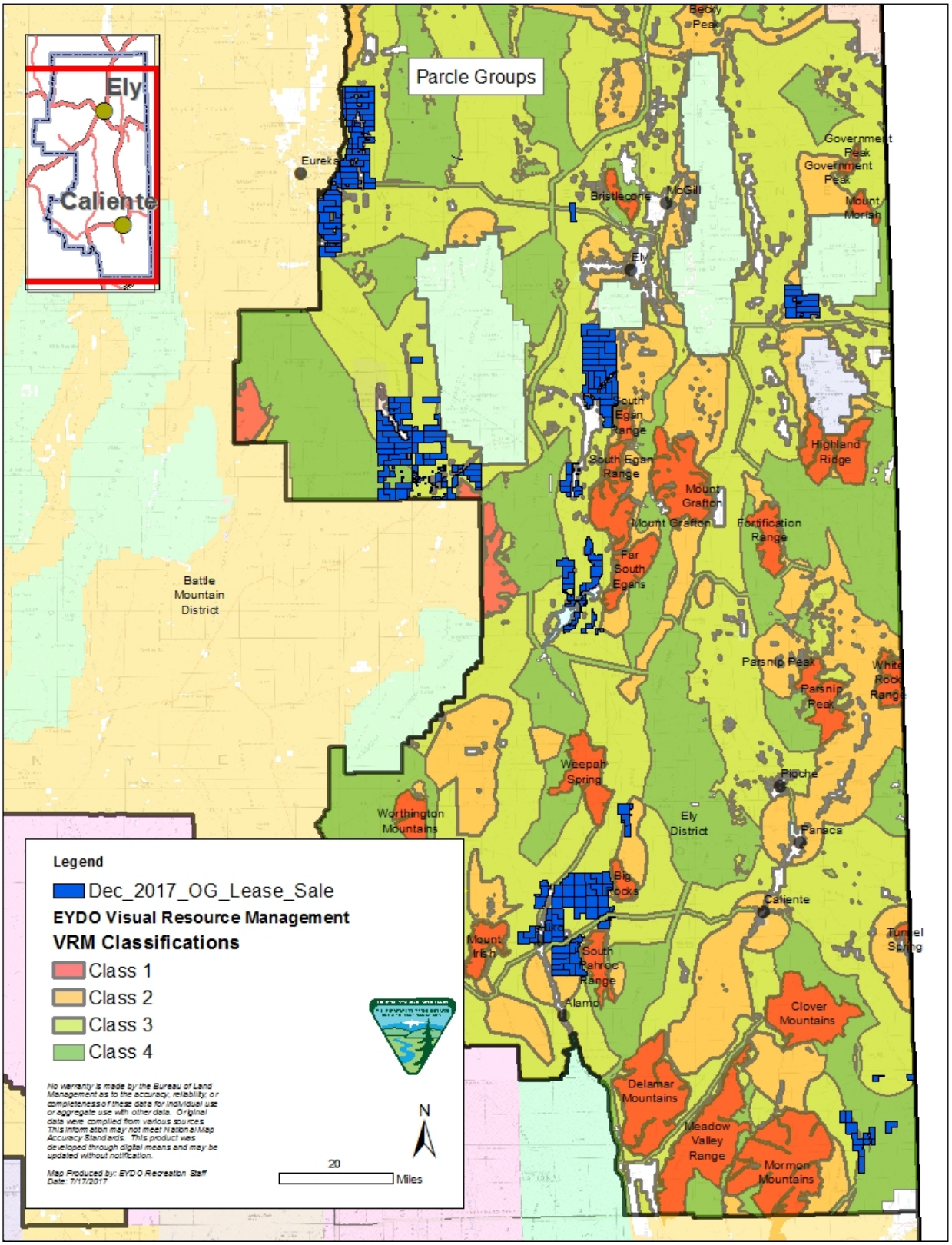
Group H is all within VRM III. Objectives for VRM III would be met during development by incorporating design features or requiring mitigation measures.

Group F has a large portion of VRM II, B and E also contain smaller portions of VRM II in addition to VRM III and IV. Exploration and development within these parcels have a high probability of not meeting the VRM II objectives. Mitigation measures would be needed to address potential issues at the development stage. Objectives for VRM III and IV would be met during development by incorporating design features or requiring mitigation measures.

No Action Alternative

Under No Action Alternative the lease sale would not occur, therefore no additional impacts to visual resources would occur.

Map 3.1 VRM Classes for All Groups of the Proposed Lease Sale



3.3.10. Land Uses

Affected Environment

Seven of the proposed lease parcels overlap private property and are considered split-estate, where the subsurface minerals are federally owned and the private ownership is limited to the surface of the land. The seven parcels, numbers 29, 30, 31, 32, 34, 48 and 50, are situated in Nye County, and comprise approximately 2,635 acres.

Many of the proposed lease parcels include pre-existing land use authorizations such as grants, leases, permits and withdrawals.

Additionally, grants, leases, and permits may be authorized prior to any proposals for exploration by an oil and gas lessee. In these instances, the holder of a land use authorization would have a valid existing right to the authorized use of public lands within the lease.

Environmental Effects

Proposed Action

The Federal Land Policy and Management Act of 1976 (FLPMA) requires that prior existing rights must be recognized. Leasing creates a valid existing right, which could conflict with other existing or future land use authorizations. Conflicts would be mitigated through agreements between relevant operators.

Temporary impacts to existing rights of way (ROW) could occur as a result of disturbance activities, such as road construction. These impacts may cause short-term disruptions to existing ROW holders.

If parcels were developed in the future, site-specific mitigation measures and best management practices would be attached as COAs for each proposed activity, which would be analyzed under their own site-specific NEPA analysis.

No Action Alternative

Under No Action Alternative, the lease sale would not occur and therefore no impacts to current land uses or access would occur.

3.3.11. Grazing Uses/Forage

Affected Environment

For the purpose of this EA the Affected Environment for the proposed oil and gas leasing area is the same as that described in Section 3.5 of the RMP/FEIS.

The Ely District BLM authorizes livestock grazing use on all allotments which overlap the proposed oil and gas leasing area.

All livestock grazing allotments within the project area are classified as perennial allotments. Term permits authorize grazing use based on perennial vegetation. Authorized grazing use includes both cattle and sheep. The majority of livestock grazing authorized is for cattle grazing.

Allotment grazing periods of use vary and include both seasonal and yearlong. Seasons include fall/winter/spring period and spring/summer/fall period. Grazing systems may include rest-rotation, deferred rotation, and deferred rest rotation. Allotments that are grazed both yearlong and seasonally include herding of cattle and sheep between public land allotments, base property, other leased or private pasture and U.S. Forest Service-administered lands. Some allotments are grazed in common by two or more livestock permittees. Livestock are either mixed together in the same use area or graze in separate use areas of the allotment. Authorized grazing use is in accordance with established use periods or seasons of use for the allotment.

Livestock grazing allotments within parcel Group A in Lincoln County and are within the Mojave Desert ecological system. The Mojave - Southern Great Basin Area Standards and Guidelines for grazing administration apply to livestock grazing for these groups. Restoration in the Mojave Desert ecosystem is especially difficult due to xeric conditions.

Livestock grazing allotments within group B, C, and D are in White Pine and Nye Counties and are within the Great Basin ecological system.

Environmental Effects

Proposed Action

There would be no direct effects from issuing new oil and gas leases because leasing does not directly authorize oil and gas exploration and development activities. Should exploration or development be proposed within the lease parcels, additional, site specific NEPA analysis would be completed to assess the potential impacts to livestock grazing.

Under the proposed action for the lease sale, livestock grazing would continue; however, should development occur on the lease, loss of forage and possible reductions of AUMs could occur in the allotments due to disturbance and activity. Range improvements and livestock movement patterns could be hindered by new roads and oil well pads. Increased traffic may lead to an increase in vehicle livestock collisions, and increasing mortality rates.

The percentage of the allotment potentially affected by development is negligible in many cases with the exception of the Snow Springs, Beacon, Gourd Springs in Group A. However, a greater effect may be realized if parcel areas cover critical grazing features (range improvements) on the allotment such as water location or critical forage areas. Potential effects on Group A parcels within critical tortoise habitat may not be realized because of an existing no surface occupancy designation.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur and no impacts to livestock grazing resources would occur.

3.3.12. Mineral Resources

Affected Environment

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

The parcels are grouped into eight groups: Group A, Group B, Group C, Group D, Group E, Group F, Group G, and Group H. Refer to Map 2.1and Appendix B for location and listing of parcels in each group.

Ely District Geology

The Ely District falls within the basin and range province where much of the topography includes island like mountain ranges and intermontane basins filled by alluvium shed off the surrounding ranges. Most of the mountain ranges are oriented north-south. Several of the basins are interconnected and allow surface drainage to flow between them. However, some basins are sealed off and the drainage within the basin does not flow outside the basin, at least at the surface. The lithology and stratigraphy in the Ely District has been described by Tschanz and Pampeyan (1970).

Historic Geology and Stratigraphy of the Ely District (summarized from Tschanz and Pampeyan 1970): Paleozoic sediments were deposited in a shallow sea environment (miogeosyncline) in the area that is now Lincoln County, Nevada. Thick sequences of Cambrian and Devonian rocks accumulated, including the carbonaceous Pilot Shale in upper Devonian time. The Mississippian assemblage included the Chainman Shale, black shale that typically contains disk-like concretions with disseminated pyrite. Depth of the sediments decreased to the southeast where they lapped onto the relatively elevated Mormon Mountain arch which was underlain by Proterozoic-aged (Precambrian) rocks. The Mormon Mountain arch was probably below sea level throughout much of Paleozoic time. At least 50,000 feet of sediments were deposited in the deeper portions of the basin northwest of the arch.

Sedimentation continued into late Triassic time when deposition became more characteristic of a developing continental environment. In late Cretaceous time, events associated with the Laramide orogeny produced thrusting that dislocated older sedimentary rocks for tens of miles to the east atop younger sedimentary units. Large scale strike-slip faults (tear faults) within the thrust plates further dislocated large blocks.

In Tertiary time, large volumes of volcanic materials were erupted. The volcanics were largely pyroclastic; welded tuff, lava and tuffaceous sediments were deposited over large areas, perhaps thousands of square miles. Subsequent to the eruption of most of the volcanics and the deposition of associated intraformational sedimentary deposits, normal faulting initiated uplift of the various north-south ranges and produced the Basin and Range topography.

Erosional forces have deposited thick accumulations of gravel and sand in the valleys. During the Pleistocene, most of the valleys in the Lincoln County area held abundant water in lakes and rivers. Finer sediments from reworked deposits were deposited in the lake beds. Rivers removed accumulated sediments from the valleys and transported them to the south. The end of the Pleistocene initiated the climates and conditions of the present Basin and Range geographic province.

Structural Geology in the Ely District: Regional structures have affected large-scale horizontal displacement on the order of 30 miles; the structures include Laramide-age thrust faults and northeast-trending strike-slip (tear) faults. Laramide thrust faults are documented in the Tule Springs Hills, Meadow Valley Mountains, Sheep Range, Pahranagat Range, and the Spotted Range. Strike-slip faulting is exemplified by three faults south of Alamo in the Pahranagat Valley (Arrowhead Mine, Buckhorn and Maynard faults). The faults represent a shear zone with significant right-lateral displacement known as the Pahranagat shear system; it has most recently

been reactivated as a left lateral system that demonstrates less cumulative displacement than the earlier system. The strike-slip system is interpreted as the propagation of a basement rift similar to the San Andreas or Las Vegas shear zones (Tschanz and Pampeyan 1970).

Tertiary normal faulting is largely responsible for the formation of the north-south mountain ranges and intervening valleys that characterize the geography of the Eastern Nevada landscape. Basin and range faulting has, however, resulted in smaller overall displacements than the tear faults and thrust faults mentioned above (Tschanz and Pampeyan, 1970).

More recently, Stewart (1980) and Rowley and Dixon (2001) have placed the regional geology of the Basin and Range into the framework of plate tectonics. Generally, the region has been subject to Mesozoic to mid-Cenozoic thrusting associated with the eastward subduction of the Pacific plate under the western United States (compression). Basin and range, north-trending, extensional faulting began about 20 million years ago.

Locatable Minerals

Locatable minerals are mostly metallic minerals, semi-precious and precious gemstones, and rare earth elements. Metallic minerals include precious metals such as gold, silver, and base metals (zinc, molybdenum, nickel, cinnabar, lead, tin, and copper. Some nonmetallic minerals can also be considered locatable such as bentonite, borax, fluorspar, and gypsum. Uranium, a rare earth element is often considered a locatable mineral. These minerals are explored and developed pursuant to the Mining Law of 1872, as amended and the Federal Land Policy and Management Act of 1976, and often occur on mining claims.

Mineral Materials (Salable Minerals)

Mineral materials (salable minerals) are available through a series of competitive and non-competitive sales and by free use permit to governmental agencies and non-profit organizations pursuant to the Materials Act of July 31, 1947, as amended, the Surface resources Act of 1955, and the Federal Land Policy and Management Act of 1976. Salable minerals include common varieties of sand, gravel, stone, pumice, pumicite, cinders, and clay. These resources are abundant throughout the Ely District and are often concentrated in the basins. Leasable Minerals

Leasable Minerals

Leasable minerals include coal, phosphate, oil, oil shale, gas, and sodium resources on the public domain as designated by the Mineral Leasing Act of 1920 as Amended. The Mineral Leasing Act was amended to include minerals associated with lands acquired by the United States and by the Geothermal Steam Act of 1970 to include geothermal resources. Leasable minerals under federal ownership are available for development through the BLM's leasing program. There are minimal to no known economic deposits of coal, phosphate or sodium in the Ely District. Geothermal resources occur throughout the Ely District as well. However, no leases or production have been authorized on the nominated lands. The regions of the Ely District vary from low to high potential for oil, oil shale, and gas deposits. Further details on oil and gas geology and potential can be found in Chapter 1.

Environmental Effects

This section discusses the potential impacts from leasing nominated parcels according to the three alternatives. Information on mineral claims, leases, exploration, and development was obtained using reports pulled from BLM's Oracle Legacy Rehost software, "LR2000 database," on July 18, 2017.

Proposed Action

Locatable Minerals

Several lode and placer mining claims occur in Parcel Groups B, F, and H and overlap nominated parcels. Additional research involving the Nevada State Office and county courthouses to determine if the claims truly overlap the parcels is not necessary for this level of analysis. Further research would be conducted during site-specific NEPA analysis when an APD is submitted, given the parcels would be leased.

Mining operations have been authorized in Section 5, 8, and 9 of Township 19 North, Range 55 East, Mount Diablo Baseline Meridian, which overlap nominated parcels NV-17-12-015 and NV-17-12-016. Operations have also been authorized in Section 22 of Township 4 North, Range 62 East, Mount Diablo Baseline Meridian, which overlap nominated parcel NV-17-12-395. Oil and Gas leasing, exploration, and development could interfere with the exploration and extraction of locatable minerals on these parcels. Potential interference may be mitigated at the time of development by coordination and agreement between the operators. Additionally, oil and gas exploration and development in Nevada typically involves reclamation within ten years and therefore, may only temporarily effect locatable mineral operations, if simultaneously authorized.

Mineral Materials

Nevada Department of Transportation holds federal aid highway materials sites within Parcel Groups B, C, D, E, F, G which contain nominated parcels NV-17–12–001, NV-17-12-018 NV-17–12–089, NV-17-12-098, NV-17–12–205, NV-17–12–206, NV-17–12–215, NV-17–12–296, NV-17–12–392 and NV-17-12-352. While drilling within these active sites could interfere with the gravel operation, it is likely that with current technologies, the well could be located within the parcel off the mineral materials sites and still access potential oil and gas deposits at depths below the gravel pit.

A lease notice would be attached to parcels NV-17–12–001, NV-17-12-018 NV-17-12-089, NV-17-12-098, NV-17–12–205 NV-17-12-206, NV-17-12-215 NV-17-12-296 NV-17-12-392 and NV-17-12-352 notifying the lessee that a mineral material site occurs on the parcel.

Leasable Minerals

The nominated lands in Group C and D contain existing leases within nominated parcels NV-17-12-086, NV-17-12-087, and NV-17-12-089, and NV-17-12-210. Issuing oil and gas leases on these lands would allow for development of potential oil, oil shale, and gas deposits, and should have minimal to no effect on potential future development of other leasable minerals (e.g. geothermal, phosphate, sodium, etc.).

No Action Alternative

The No Action Alternative would not have an effect on locatable minerals, mineral materials, or leasable minerals except that it would reduce the opportunity for exploration and discovery of potential oil and gas deposits that are needed to supply our local, regional, and national needs.

3.3.13. Lands with Wilderness Characteristics

Affected Environment

On June 1, 2011, the Secretary of the Department of the Interior issued a memorandum to the BLM Director that in part affirms BLM's obligations relating to wilderness characteristics under Sections 201 and 202 of the Federal Land Management Policy Act. The BLM released Manuals 6310 and 6320 in March 2012, which provide direction on how to conduct and maintain wilderness characteristics inventories and provides guidance on how to consider whether to update a wilderness characteristics inventory.

The primary function of an inventory is to determine the presence or absence of wilderness characteristics. An area having wilderness characteristics is defined by:

- Size - at least 5,000 acres of contiguous, road-less federal land,
- Naturalness, and
- Outstanding opportunities for solitude or primitive and unconfined types of recreation.
- The area may also contain supplemental values (ecological, geological, or other features of scientific, educational, scenic, or historical values).

The Nevada BLM published the original draft wilderness review in 1979, and issued the intensive wilderness inventory decision in 1980. In 2011, the Ely District Office BLM began updating the lands with wilderness characteristics (LWC) inventory on a project-by-project basis until there is a land use plan revision. The project area has received an inventory update. Of the 208 proposed oil and gas lease parcels, 71 parcels overlap 15 inventory units which were found to possess wilderness characteristics (see Table 3.9). Of this, eight of the inventory units were found to possess wilderness characteristics on their own merits. The other seven units inherited the outstanding opportunities of adjacent wilderness areas.

There has not been a land use plan amendment to determine if or how these LWC units would be managed to protect the wilderness characteristics. The following LWC units cover a total of 375,691 acres. These units lie within parcel groups A-F and H (see maps following Table 3.9).

Table 3.9 Lands with Wilderness Characteristics within Nominated Parcels

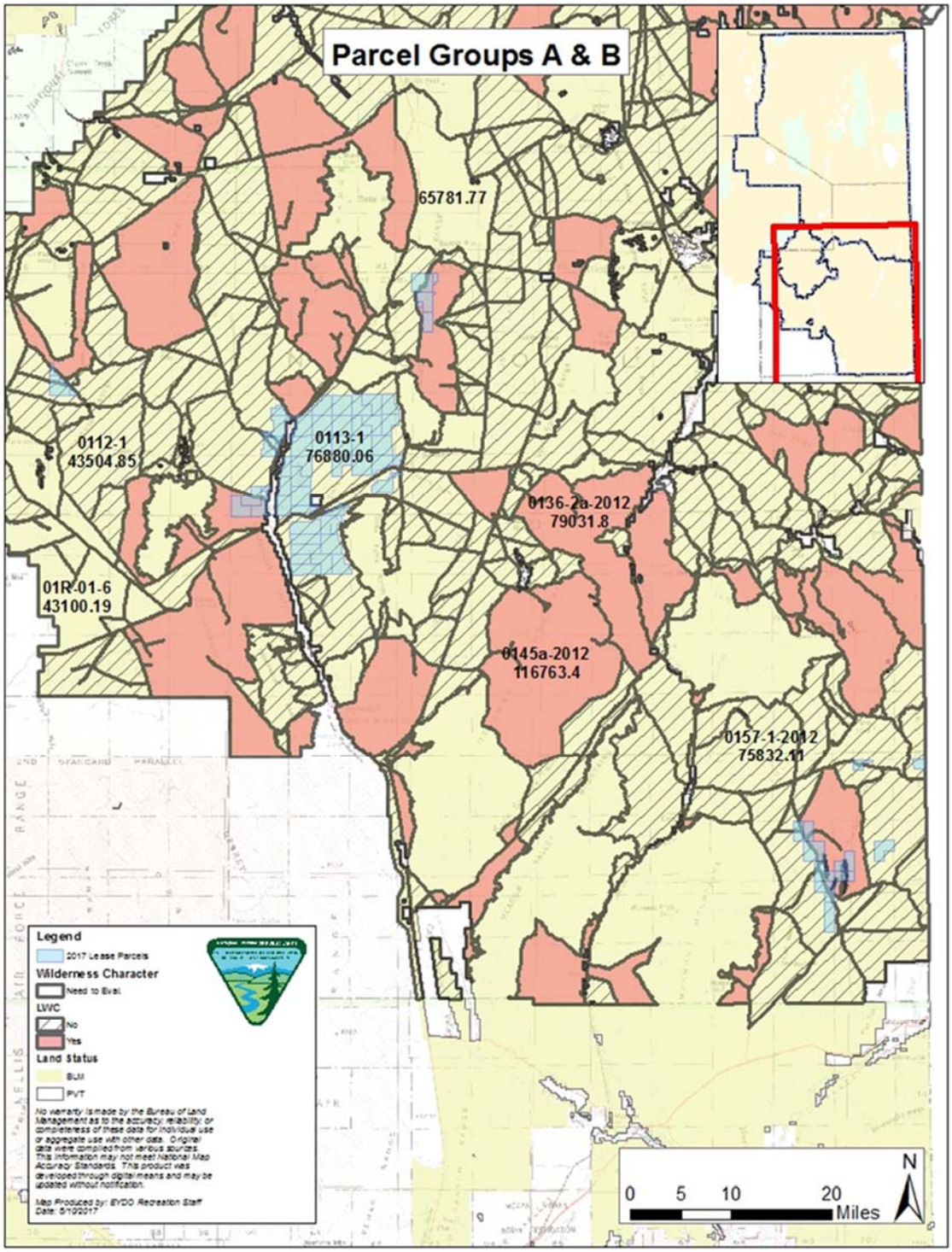
Unit Unique Identifier **Parcel Group A**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recre-ation? Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
0180-1-2011	Yes 35,518	Yes	Yes	No	Yes Geologic	Yes	NV-17-12-437 NV-17-12-438 NV-17-12-439 NV-17-12-440 NV-17-12-441 NV-17-12-446 NV-17-12-447	1,221 232 1,243 665 571 1,670 940
Unit Unique Identifier **Parcel Group B**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation** **Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
0107-1	Yes 33,117	Yes	Yes	Yes	Yes Cultural	Yes	NV-17-12-397 NV-17-12-398 NV-17-12-399 NV-17-12-400	314 929 1,614 1,447
040-247-7	Yes 7,814	Yes	Yes	No	Yes Cultural	Yes	NV-17-12-368 NV-17-12-352	17 5
249D-1-2013	Yes 16,569	Yes	Yes	Yes	No	Yes*	NV-17-12-360 NV-17-12-361 NV-17-12-363	1,220 1,228 1,921
242-2	Yes 20,352	Yes	Yes	Yes	No	Yes*	NV-17-12-314	93
Unit Unique Identifier **Parcel Group C**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation ?** **Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
172-2-2013	Yes 11,647	Yes	Yes	Yes	No	Yes*	NV-17-12-211	265
172-2012	Yes 19,991	Yes	Yes	Yes	Yes Cultural	Yes*	NV-17-12-211 NV-17-12-212 NV-17-12-208 NV-17-12-209	400 631 862 7
226-1-2012	Yes 30,268	Yes	Yes	Yes	Yes	Yes*	NV-17-12-207 NV-17-12-206	517 544

Unit Unique Identifier **Parcel Group D**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation ?** **Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
040-147-8	Yes 26,173	Yes	Yes	Yes	No	Yes	NV-17-12-059 NV-17-12-060 NV-17-12-061 NV-17-12-062 NV-17-12-063 NV-17-12-065	1,759 636 800 1620 819 865
148-1	Yes 12,038	Yes	No	No	No	Yes*	NV-17-12-100	1348
148-2	Yes 18,486	Yes	Yes	Yes	No	Yes*	NV-17-12-059 NV-17-12-062 NV-17-12-097	155 461 182
Unit Unique Identifier **Parcel Group E**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation ?** **Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
NV-123b-1b-2012	Yes 23,341	Yes	Yes	Yes	No	Yes	NV-17-12-219 NV-17-12-222 NV-17-12-235 NV-17-12-236	110 1 58 206
Unit Unique Identifier **Parcel Group F**	**Sufficient Size?** **Yes/No (acres)**	**Natural-ness?** **Yes/No**	**Outstanding Solitude?** **Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation ?** **Yes/No**	**Supple-mental Values?** **Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
NV-086-1-2012	Yes 20,548	Yes	Yes	Yes	No	Yes	NV-17-12-292 NV-17-12-293 NV-17-12-294 NV-17-12-295 NV-17-12-296 NV-17- 12-297 NV-17-12-299	1,633 1,794 2,114 210 1,860 1,360 423

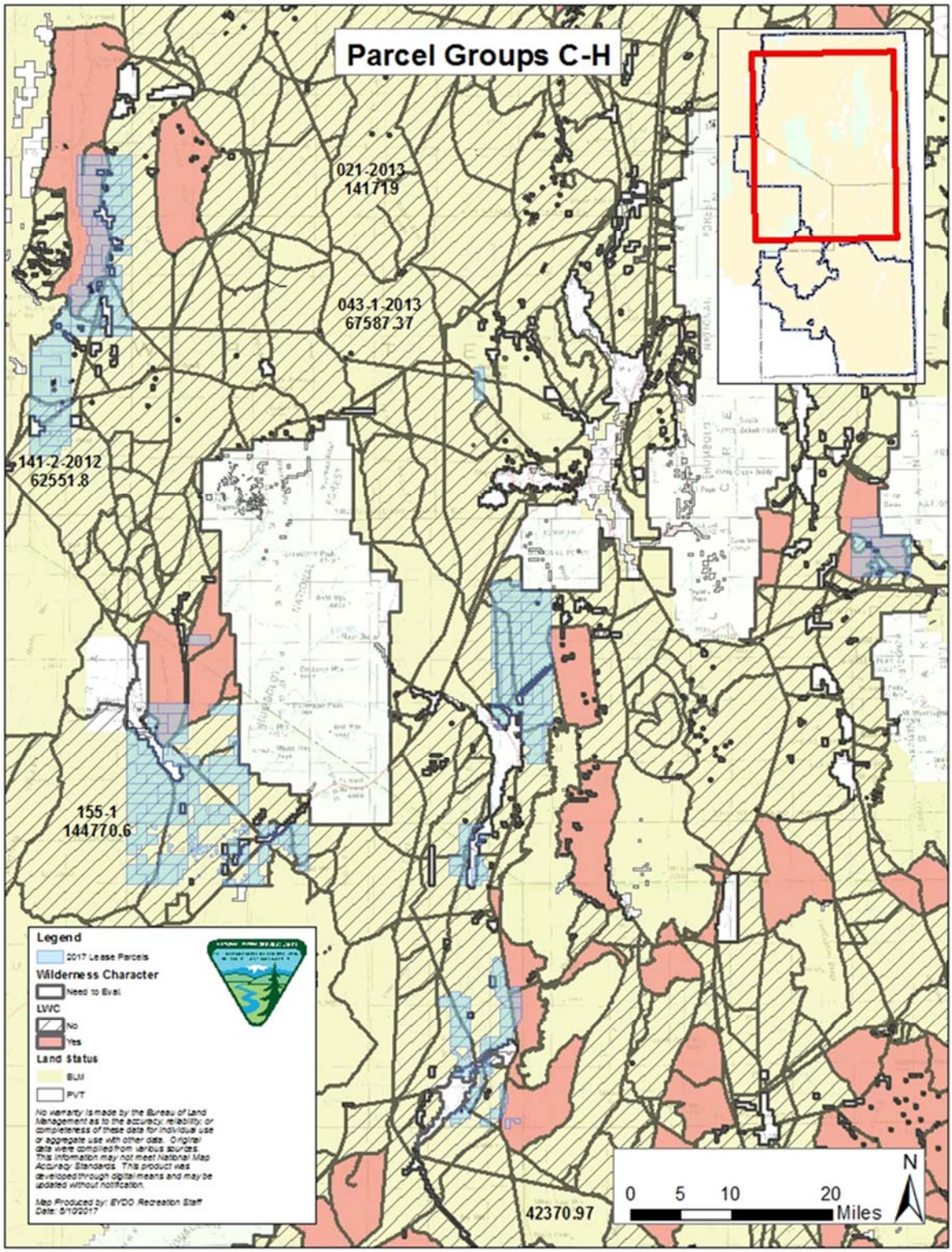
NV-100B-1a-2012	Yes 7,193	Yes	Yes	Yes	Yes Geologic	Yes	NV-17-12-293 NV-17-12-294 NV-17-12-295 NV-17-12-296 NV-17- 12-297 NV-17-12-298 NV-17-12-299	11 4 1,096 257 145 2,335 117
Unit Unique Identifier Parcel Group H	**Sufficient Size? Yes/No (acres)**	**Natural-ness? Yes/No**	**Outstanding Solitude? Yes/No**	**Outstand-ing Primi-tive & Un-confined Recreation ? Yes/No**	**Supple-mental Values? Yes/No**	**Updated Determi - nation**	**Overlapping Parcel(s)**	**Acres of Parcel Over-lapping LWC Unit**
NV-060-5041A	Yes 92,636	Yes	Yes	Yes	No	Yes	NV-17-12-013 NV-17-12-015 NV-17-12-016 NV-17-12-018 NV-17-12-019 NV-17-12-021 NV-17-12-024 NV-17-12-025 NV-17-12-027 NV-17-12-028 NV-17-12-029 NV-17-12-030 NV-17-12-031 NV-17-12-032 NV-17-12-033 NV-17-12-035 NV-17-12-036 NV-17-12-038 NV-17-12-039	272 904 1,320 1,045 579 40 719 2,005 2,319 834 1,780 940 386 1,905 1,424 1,873 1,266 1,690 952

* This unit possesses wilderness characteristics based on the adjacent designated wilderness.

Map 3.2 Lease Parcels Overlapping Wilderness Characteristics Inventory Units - Groups A & B



Map 3.3 Lease Parcels overlapping Wilderness Characteristics Inventory Units - Groups C - H



Environmental Effects

Proposed Action

The proposed action to authorize oil and gas leasing would potentially impact wilderness characteristics in the 15 inventory units when and if exploration and production activities occur. Short-term (5-10 years) disturbances may impair the wilderness character of the inventory units by reducing and possibly eliminating wilderness characteristics. Depending on the location and density of exploration wells, the inventory units may be reduced to areas of less than 5,000 acres; naturalness could be eliminated across the developed portions of the units; and opportunities for solitude or a primitive and unconfined type of recreation may be eliminated throughout the unit.

If exploration wells are plugged and abandoned, they would be reclaimed immediately after drilling or construction. Therefore, in the long term, it is possible that all disturbances would be reclaimed allowing the area to return to a natural state; and opportunities for solitude or a primitive and unconfined type of recreation would return. Impacts to size may also be reclaimed after exploration, but depending on the extent of wells and associated facilities (roads, gravel pits, etc.) impacts may remain should any of the supporting facilities continue to be used that could continue to eliminate wilderness characteristics based on size. For any producing wells, the impacts would be long term (20 years) or much longer. At that point the impacts to LWC would be considered permanent.

The anticipated disturbance of the acreage overlapping LWC equals approximately 64 acres (see Table 3.10).

Table 3.10 LWC Units Within Potential Oil and Gas Lease Parcels

Total acres of lease parcels overlapping LWC	Estimated Acres of potential disturbance in LWC
63,188	64

No Action Alternative

Under the No Action Alternative, all expressions of interest to lease would be denied or rejected. Therefore, there would be no human-caused alterations to the existing landscape from this project and there would be no impacts to the wilderness characteristics.

3.3.14. Native American Religious and other Concerns

Affected Environment

Ethnographic documents reference the Western Shoshone Tribes (Duckwater Shoshone Tribe of the Duckwater Reservation, Nevada and the Ely Shoshone Tribe of Nevada) and the Southern Paiute Tribes (Moapa Band of Paiute Indians of the Moapa River Indian Reservation, Nevada and Paiute Indian Tribe of Utah) resided within the current boundaries of the Ely District in their traditional homeland prior to statehood. For example, historically tribes resided in different geographic location on seasonal bases for hunting, gathering of native plants and religious activities. The BLM initiated consultation and coordination with Tribes to identify any sites of

concern (see Consultation and Coordination, Chapter 5).

Environmental Effects

The main concern consistently identified by tribes is the protection of and access to natural, medicinal, and sacred resources, traditional use areas, and sacred sites. Each tribe also maintains a general concern for the welfare of plants, animals, air, landforms, and water. Tribal governments emphasize the health, safety, and prosperity of their members and seriously evaluate the socioeconomic impacts of projects near their communities. Four tribes expressed concern with leasing parcels and potential oil and gas development as a result of the December 2017 Ely District Lease Sale. Of those, two tribes expressed concerns with specific parcels and two expressed general concern with leasing and subsequent development. Because Parcel Group D is close to the Duckwater Shoshone Tribe's reservation and traditional use area, the tribe has expressed specific concern over the effects of this project on the resources and on their community.

Any development on parcels that are leased would require analysis under NEPA and compliance with all laws, regulations, and policies governing Federal actions potential affecting cultural resources and areas of tribal interest. In addition to federal cultural and historic resource protection laws, consultation and coordination with Indian Tribal Governments is requisite, ongoing, and will be initiated for any additional action, including but not limited to any ground disturbing activities, construction, or an Application for Permit to Drill (APD).

Proposed Action

Under Proposed Action, all parcels would be offered for lease, with exploration and development possible. This alternative would result in a higher potential for adverse effects to areas of tribal interest than the No Action Alternative.

No Action Alternative

Under No Action Alternative, no parcels would be offered for sale. Therefore, no effects to areas of tribal interest would be affected by oil and gas exploration and development.

Chapter 4 Cumulative Impacts

4.1. Introduction:

As required under the National Environmental Policy Act (NEPA) and the regulations implementing NEPA, this section analyzes potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the Proposed Action within the area analyzed for impacts in Chapter 3 specific to the resources for which cumulative impacts may be anticipated. A cumulative impact is defined as "the impact which results from the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 Code of Federal Regulations (CFR) 1508.7).

4.2. Past, Present, and Reasonably Foreseeable Future Actions

4.2.1. Past Actions

The Ely District is rich in natural resources and the cumulative effects study area has been used for a wide array of activities over the years. Mining, grazing, recreation, realty actions, and oil exploration have been conducted throughout the Ely District and more than likely, would continue for many more years. While more than 200 wells have been drilled in the Ely District, only two are in production.

4.2.2. Present Actions

Mining, grazing, recreation, realty actions, and oil exploration are being conducted throughout the District. Refer to the affected environment discussions in Chapter 3 for presently authorized activities affecting the nominated parcels.

4.2.3. Reasonably Foreseeable Future Actions

Table 4.1 shows a list of Reasonably Foreseeable Future Actions (RFFA) that have been analyzed for environmental impacts within the project area. For purposes of this cumulative impacts analysis the project area includes Lincoln County, White Pine County and the northeastern corner of Nye County. The approximate total ground disturbance of RFFAs is 15,109 acres. There is one restoration project within the project area that proposes to re-seed 185 acres of burned desert tortoise habitat near Parcel Group A in Lincoln County. Therefore, it is reasonable to expect an additional 14,924 acres of approximate ground disturbance within the project area.

Table 4.1 Reasonably Foreseeable Future Actions

Project Name	Location (County)	Type of Action	Acres of Disturbance
Robber's Roost APD	White Pine	Mining	4
Gold Rock Mine Project	White Pine	Mining	3,946
Pan Mine Project	White Pine	Mining	3,301
Bald Mountain Mine North and South	White Pine	Mining	7,097

Operations Area Projects			
Envy Energy APD	White Pine	Mining	4
Round 3 Land Sales	Lincoln	Land Disposal	427
Murphy's Gap APD	Lincoln (BARNM*)	Mining	6
LCAI Paleohydrological Statigraphy Trenching	Lincoln	Archaeological Surveys	302
Lincoln County Non-motorized Multipurpose Trail System	Lincoln	Recreation	21
			Total 15,109
Mojave Desert Tortoise Habitat Burned Area Restoration	Lincoln	Restoration/Seeding	185
			Total disturbance after restoration project 14,924

*Basin and Range National Monument

4.3. Cumulative Impact Analysis

For the purpose of this EA, only indirect impacts are discussed in this section. Direct incremental cumulative impacts from a potentially proposed oil well would be analyzed during the APD review process. There are no cumulative impacts from leasing. The following is a discussion of cumulative impacts resulting from potential future development.

4.3.1. Water Resource (Water Rights, Water Quality and Floodplains)

The cumulative effects analysis area for water resources includes the closed to semi-closed basins of White Pine, Lincoln, and northeastern Nye counties located within the boundaries of the analysis area. The cumulative effects analysis area is the same as the Ely RMP for Water Resources. This EA incorporates by reference the RMP/FEIS (BLM 2007). The RMP analysis lost two Coal Fired plants at the time of writing, but has gained three large Mining Operations in the EIS stage, Bald Mountain Mine Expansion, Pan, and Gold Rock; the net impact is considered to be equivalent.

In general, oil and gas surface disturbance within the boundaries of the lease parcels could lead to limited increased erosion and instability of soils in local areas which may increase sediment and salt loading in confined basins *de minimis*. There may be some loss of water quality characteristics in groundwater that may or may not be used as water sources in the future. Oil and gas exploration and development would likely add to sediment and salt loads, but may not be measurable.

Short-term increases in runoff, soil erosion, and related sedimentation may occur on those areas where vegetation treatments occur. Interrelated projects would have the potential to create impacts on both surface and groundwater resources through additional erosion and sedimentation as a result of land disturbance, further consumption of available water resources, and additional releases of undesirable water quality constituents (e.g., industrial chemicals, treated domestic effluent) into receiving waters. Cumulative impacts of the RMP/FEIS (BLM 2007) would be minimized over the long term by

extensive vegetation management and administration of other land utilizing a balanced ecological system approach.

Avoidance of riparian habitats, reclamation strategies and State and federally-imposed sediment and storm-control measures provide effective means of controlling excess sediment transport to those systems that support riparian communities.

4.3.2. Fish and Wildlife

All wildlife species have preferred habitats, some of which may be seasonal. Many disturbances, both natural and human caused may result in wildlife moving to less optimal habitats, which may already be at carrying capacity. This could result in reductions in population sizes due to less successful reproduction or direct mortality. Species dependent on very restricted habitats may be especially affected. The additional disturbance of 14,924 acres combined with the lease sale activities could result in loss of specific habitats, fragmentation and disruption of movement patterns. The stipulations required through the RMP or requirements for mitigation measures on a site-specific basis could minimize impacts from these activities.

4.3.3. USFWS Listed (or proposed for listing) Threatened or Endangered Species or critical habitat

The combination of past, present and future activities could cumulatively impact the listed species included in this document. The potential loss of habitat resulting from this lease sale within desert tortoise habitat would be offset by the Mojave Desert Tortoise Habitat Burned Area Restoration project which would rehabilitate 185 acres of habitat lost to fire.

4.3.4. Special Status Animal Species, other than those listed or proposed by the USFWS as Threatened or Endangered

The combination of past, present and future activities could cumulatively impact special status species such as sage grouse. These impacts could result in loss of habitats, which may uniquely support some species, may fragment habitats resulting in reductions in reproductive success of some species, or may have potentially adverse effects on individuals in populations. The LCAI Paleohydrological Stratigraphy Trenching project would involve disturbance to OHMA and GHMA within Cave Valley and Lake Valley in Lincoln County.

4.3.5. Special Status Plant Species, other than those listed or proposed by the USFWS as Threatened or Endangered

Future development within the proposed lease sale parcels would result in additional vegetation loss and surface disturbance. Past and present oil and gas activities in the area have already created disturbance, and oil and gas development is anticipated to continue throughout the analysis area. Successful reclamation would reduce the risk to healthy plant communities and provide an opportunity to improve degraded vegetative communities within the analysis area.

4.3.6. Mineral Resources

Exploration and development for locatable minerals, mineral materials, and leasable minerals have occurred near the nominated lands. The authorized mining projects listed above are in the vicinity of parcel groups B, C, D, E, and H. The RFFD assumes permitting an average of 22 wells for 81 acres of short-term and 33 acres of long-term disturbance each year since 2008. Therefore, 198 wells and 729 acres of short-term and 297 acres of long-term disturbance is assumed to have occurred since 2008. The Ely district has only approved 13 APDs since 2008 averaging a single well per pad, however, not every APD approved is actually drilled and only 10 wells have resulted. Table 4.1 shows 3 APDs assumed as future actions totaling 14 acres of predicted disturbance. If 22 wells are permitted as a result of offering these parcels for sale, the total number of wells permitted in the Ely District would be 38 of the assumed potential 198.

Chapter 5 Consultation and Coordination

5.1. Introduction

The issue identification section of Chapter 3 provides the rationale for issues that were considered but not analyzed further and identifies those issues analyzed in detail in Chapter 3. The issues were identified through the public and agency involvement process described in sections 5.2 and 5.3 below.

5.2. Persons, Groups, and Agencies Consulted

Table 5.1 Persons, Groups, and Agencies Consulted

Name	Purpose & Authority for Consultation or Coordination	Findings and Conclusions
Nevada State Historic Preservation Office (SHPO)	Consultation for undertakings as required by the National Historic Preservation Act (16 USC 1531)	A Cultural Resources Inventory Needs Assessment was completed for this project as per the requirements of the State Protocol Agreement.
United States Fish and Wildlife Service (USFWS)	Endangered Species Act; Threatened, Endangered, or Proposed Species; National Wildlife Refuges	Recommendations for deferrals, stipulations or other mitigation measures.
Nevada Department of Wildlife (NDOW)	Fish and Wildlife, BLM Special Status Animal Species, Wildlife Management Areas, Threatened, Endangered, or Proposed Species	Recommendations for deferrals, stipulations or other mitigation measures.
Confederated Tribes of the Goshute Reservation, NV-UT, Duckwater Shoshone Tribe of the Duckwater Reservation, NV, Ely Shoshone Tribe of Nevada, Te-Moak Tribe of the Western Shoshone Indians of Nevada; Elko Band Council; South Fork Band Council; Battle Mountain Band Council, Paiute Indian Tribe of Utah; Indian Peaks Band of Paiutes; Shivwits Band of Paiutes, Moapa Band of Paiute Indians of the Moapa River Indian Reservation, Las Vegas Paiutes Tribe of the Las Vegas Indian Colony, and the Yomba Shoshone Tribe of the Yomba Indian Reservation, NV	Tribal consultation	Consultation is ongoing. A summary of consultation thus far is described below

5.3. Tribal Consultation

On July 17, 2017 the Ely District Office mailed certified letters extending invitations to the following tribes: Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe of the Duckwater Reservation, Ely Shoshone Tribe of Nevada, Te-Moak Tribe of the Western Shoshone Indians of Nevada; Elko Band Council; South Fork Band Council; Moapa Band of Paiute Indians of the Moapa River Indian Reservation, and the Yomba Shoshone Tribe of the Yomba Indian Reservation, to assist BLM with any known traditional religious sites or cultural

sites of importance that would potential be adversely affected.

5.4 List of Preparers

Table 5.2 List of BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Jeremiah Wagener	Geologist (Caliente)	Minerals Resources, Editor
Jessicca Patterson	Wildlife Biologist (Caliente)	Fish and Wildlife, Special Status Plants and Animals, Threatened and Endangered Species
Wendy McCrosky	Realty Specialist	Land Uses
Cameron Boyce	Natural Resource Specialist (Caliente)	Grazing Uses/Forage, and Noxious and Non-Native Invasive Species
Elizabeth Domina	Outdoor Recreation Planner (Caliente)	Visual Resources Management
David (Blake) Baker	Outdoor Recreation Planner; Wilderness Specialist	Lands With Wilderness Characteristics
Harry Konwin	Archaeologist (Caliente)	Cultural Resources, Heritage Special Designations
Elizabeth Seymour	Tribal Coordinator (Ely District)	Native American Religious Concerns, Tribal Consultation
Andrew Gault	Natural Resource Specialist (Nevada State Office)	Water Resources (including groundwater, surface water, water rights, riparian and wetland zones, floodplains and municipal wellhead zones and drinking water protection areas)
Dave Jones	Air Quality Specialist (Nevada State Office)	Air Quality and Climate Change
Jon Prescott	Planning and Environmental Coordinator (Caliente)	Land Use Plan Compliance, Editor

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Acronyms

ACEC:
Area of Critical Environmental Concern

APD:
Application for Permit to Drill

AQRV:
Air Quality Related Values

BLM:
Bureau of Land Management

BMPs:
Best Management Practices

BO:
Biological Opinion

CFR:
Code of Federal Regulations

COAs:
Conditions of Approval

DR:
Decision Record

EA:
Environmental Assessment

EIS:
Environmental Impact Statement

EOI:
Expression of Interest

EPA:
Environmental Protection Agency

ESA:
Endangered Species Act

EYDO:
Ely District Office

FEMA:
Federal Emergency Management Agency

FLPMA:
Federal Land Policy and Management Act

FONSI:
Finding of No Significant Impact

GHG:
Green House Gas

HAP:

Hazardous Air Pollutant

IM:
Instructional Memorandum

IPCC:
Intergovernmental Panel on Climate Change

LCCRDA:
Lincoln County Conservation, Recreation, and Development Act

LUP:
Land Use Plan

LWC:
Lands with Wilderness Characteristics

MLA:
Mineral Leasing Act

MOU:
Memorandum Of Understanding

NAAQ
National Ambient Air Quality Standards

NCLS:
Notice of Competitive Lease Sale

NDOW:
Nevada Department of Wildlife

NDWR:
Nevada Division of Water Resources

NEPA:
National Environmental Policy Act

NHPA:
National Historic Preservation Act

NOC
National Operations Center

NRHP:
National Register of Historic Places

NSHT:
National Scenic and Historic Trails

PBO:
Programmatic Biological Opinion

RASA:
Regional Aquifer-System Analysis

RFFD:
Reasonably Foreseeable Future Development

RFFS:
Reasonably Foreseeable Future Action

RMP:
Resource Management Plan

RMP/FEIS:
Resource Management Plan—Final Environmental Impact Statement

ROW:
Rights-of-way

SHPO:
State Historic Preservation Office

TCPs:
Traditional Cultural Properties

TSP:
Total Suspended Particulates

US:
United States

USC:
United States Code

USFWS:
United States Fish and Wildlife Service

WMA:
Wildlife Management Area

VRM:
Visual Resource Management